This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

THE UNIVERSITY OF MICHIGAN · LIBRARIES · 1817

Digitized by Google

Digitized by Google

Digitized by Google

Origin and History

OF ALL THE

Pharmacopeial Vegetable Drugs, Chemicals and Preparations

WITH

Bibliography

VOLUME I

VEGETABLE DRUGS

8th and 9th Decennial Revisions
(Botanical Descriptions Omitted)

BY

JOHN URI LLOYD

Prepared under the Auspices of and Published by the
American Drug Manufacturers' Association,
Washington, D. C.

CINCINNATI:
THE CAXTON PRESS

Digitized by Google

CHEM
RS
160
.A512o

VOLUME II
(In Process)

CHEMICALS AND PREPARATIONS

9th Decennial Revision

BY
SIGMUND WALDBOTT, PH.D.
AND
FRANCIS F. HEYROTH, B.S., M.A.

6-27, 1922

COPYRIGHT, 1921, BY
AMERICAN DRUG MANUFACTURERS' ASSOCIATION.

Digitized by Google

HISTORICAL INTRODUCTION*

At a special meeting of the Committee on Standards and Deteriorations, American Drug Manufacturers' Association, held at the Waldorf-Astoria, New York, March 30, 1917, it was decided that an historical investigation of the drugs and preparations official in the *Pharmacopeia of the United States* was an important and much-needed work that could be properly undertaken and contributed to the world under the auspices of the Association. It was deemed essential that the publication should be accompanied by bibliographical data sufficient to enable one engaged in special research to obtain first-hand references to publications embracing the history of the subjects included. An appropriation adequate to cover the necessary expense was made and approved.

The Committee to undertake this work, as announced by Mr. Charles J. Lynn, President of the Association, consisted of the following:

Dr. A. R. L. Dohme, Chairman,
Dr. J. M. Francis,
Dr. John Uri Lloyd.

Since the Lloyd Library, Cincinnati, Ohio, carried the documents and publications essential for this research, Dr. Lloyd was requested to formulate a working plan in accordance with which the work might be

* The author comprehends that the members of the American Drug Manufacturers' Association are fully informed of the facts this Introduction includes. However, as the publication is not to be restricted to the members of this Association, others may either now or at a period more or less remote need the data here presented, which in this sense may be considered as an historical part of the publication.—*J. U. L.*

Digitized by Google

accomplished. He personally accepted the responsibility for the history of all the *vegetable* drugs of the *Pharmacopeia*, of both the Eighth and Ninth Decennial Revisions. This he now presents, completed, as a personal offering to the Society. As one fully competent to undertake the history of the definite *Chemicals and Pharmaceutical Compounds of the Pharmacopeia*, Dr. Lloyd suggested the name of Dr. Sigmund Waldbott, whose exceptional experiences in library research, and whose knowledge of languages and science generally are so well known. Dr. Waldbott agreed to assume this responsibility, and selected as his associate Professor Francis Farnham Heyroth, M.A. The outline of the work as planned by them was presented to the Chairman of the Committee, Dr. Dohme, and having been approved by him, research work was begun by them on June 25, 1917.

As the author of Volume I understands the subject, the intent is to locate, with reference data, not only the earliest attainable uses made of each Pharmacopeial drug, but important historical incidents in the passing along. Early in the progress of the work it became evident, from the abundance of material to be considered, that it would be impracticable, as well as unnecessary, to do more in a given study than record the titles of a comparatively few of the many publications connected with each subject. To attempt to duplicate references in the setting of each drug, as recorded in the various series of Dispensatories, Pharmacopeias, Materia Medicas and kindred works on medicine and pharmacy, past and present, as well as the innumerable pamphlets, historical notes, Society Proceedings and Treatises that

Digitized by Google

might well be consulted for special purposes, would make of the Bibliography alone a huge volume. As examples are cited the references following the studies of lobelia and cinchona.

The Association under whose auspices this research has been accomplished embraces not only scientific and professional men, but others who have interests both in applied science, in serviceable commerce and in varied industries. Hence occasional discussions of some length concerning problems of historical value connected intimately with a drug's vicissitudes in commercial channels have been considered not out of place.

It will be noticed that many drugs extensively employed by practicing physicians are omitted altogether from the work. This is due, not to the author's unfavorable opinion as regards their importance or service to humanity, but to the fact that the publication is restricted in its scope to the drugs of the *Pharmacopeia of the United States*, Eighth and Ninth Decennial Revisions.

Another limitation that is a source of much personal regret is that the work, being confined to the history of crude drugs, has enforced the neglect of many worthy special non-official preparations derived therefrom that have been perfected and introduced to the world of medicine by members of our Association, as well as by pharmacists, chemists and physicians.

The author takes pleasure in stating that the translations from Greek and Latin authors were made by his secretary, Miss Margaret Stewart, A.M., who also contributed the Pharmacopeial record (following the title) of each drug named in Volume I, and gave to the work her continued care as research progressed. For

Digitized by Google

compiling the Index accompanying Volume I, and for other helpful details, credit is due, and thanks extended, to Miss Eda Van Guelpen, of the author's staff.

The foregoing was written in 1918, at the time of the completion of the manuscript of Volume I (January 1, 1918). It was then expected that publication of Volume I would follow at once, but this was interrupted by reason of disturbances due to the World War.

The result has been that only in April, 1920, was it desirable to submit to the Association, at its annual meeting, the manuscript of Volume I. This the Association promptly accepted, and suggested the appointment of a committee to take charge of its publication. President Wm. A. Sailer named as such committee the following members:

Messrs. A. R. L. Dohme, J. M. Francis, John Uri Lloyd, Caswell A. Mayo and W. J. Woodruff, with Professor Lloyd as Chairman.

This committee delegated the work of typography, binding, etc., to a sub-committee consisting of—

Messrs. Mayo, Lloyd and Woodruff, with Dr. Mayo acting as Chairman.

Mr. Mayo took charge of the publication, and the members of the committee read the galley proofs.

To all members of these Committees, as well as to the members of the Association generally, who without exception have not only made no complaint, but have cheerfully given all assistance possible in furnishing data needful, the writer desires to extend his earnest thanks.

As a final interruption to the progress of the work, on the very day when came to the author the galley

Digitized by Google

proof of Volume I (December 15, 1920), came also to him an attack of pneumonia of the most pronounced type. Realizing that to ask the Committee or their Chairman to do more than read the galley proof would be an imposition, he turned to his life-long friend, Professor Harvey Wickes Felter, M.D., whose experience in materia medica and history of drugs is exceptional. Comprehending the situation, Dr. Felter took upon himself what would have been the author's care as concerns the many final details, for which the author is very grateful.

Appreciating fully that neither Dr. Felter nor the Committee could overcome faults due to misplaced judgment or errors of interpretation, the author unreservedly assumes responsibility for the publication's short-comings.

JOHN URI LLOYD.

Cincinnati, April 19, 1921.

Digitized by Google

Digitized by Google

CONTENTS

Historical Introduction.. v
List of Illustrations..... xiii
Acacia..... 1
Aconitum..... 3
Aloe..... 4
Althæa..... 14
Amygdala Amara..... 15
Amygdala Dulcis..... 15
Anisum..... 16
Anthemis..... 17
Apocynum..... 17
Arnica..... 18
Asafetida..... 19
Aspidium..... 23
Aspidosperma..... 24
Aurantii Amari et Dulcis Cortex..... 25
Balsamum Peruvianum.. 26
Balsamum Tolutanum... 27
Belladonnæ Radix et Folia 28
Benzoinum..... 30
Berberis..... 31
Buchu..... 32
Calamus..... 33
Calendula..... 34
Calumba..... 34
Cambogia..... 38
Camphora..... 39
Cannabis Indica..... 40
Cantharis..... 47
Capsicum..... 48
Cardamomum..... 48
Carum..... 49
Caryophyllus..... 51
Cassia Fistula..... 52
Chimaphila..... 52
Chirata..... 53
Chondrus..... 53
Chrysarobinum..... 54
Cimicifuga..... 54
Cinchona..... 62
Cinnamomum, Cassia.... 83
Coca..... 84
Coccus..... 103
Colchici Cormus et Semen..... 104
Colocynthis..... 105
Conium..... 108
Convallaria..... 109
Copaiba..... 110
Coriandrum..... 117
Croton Tiglium..... 117
Cubeba..... 121
Cusso..... 123
Cypripedium..... 124
Digitalis..... 125
Elaterium..... 130
Ergota..... 130
Eriodictyon..... 132
Eucalyptus..... 134
Euonymus..... 135
Eupatorium..... 137
Ficus..... 138
Fœniculum..... 140
Frangula..... 140
Galla..... 141
Gambir..... 142
Gaultheria..... 144
Gelsemium..... 150
Gentiana..... 152
Geranium..... 153
Glycyrrhiza..... 153
Gossypii Cortex..... 155
Granatum..... 156
Grindelia..... 158
Guaiacum..... 159
Guarana..... 160
Hæmatoxylon..... 161
Hamamelidis Cortex et Folia..... 162
Hedeoma..... 162
Humulus..... 163
Hydrastis..... 164
Hyoscyamus..... 166

Digitized by Google

Ipecacuanha.....168
Jalapa.....176
Kino.....177
Krameria.....178
Lactucarium.....179
Lappa.....179
Leptandra.....180
Limonis, Cortex et Succus.181
Linum.....183
Lobelia.....183
Lycopodium.....191
Maltum.....191
Manna.....192
Marrubium.....205
Mastiche.....205
Matico.....212
Matricaria.....213
Mel.....213
Mentha Piperita.....215
Mentha Viridis.....215
Mezereum.....216
Moschus.....217
Myristica.....218
Myrrha.....219
Nux Vomica.....221
Opium.....224
Pareira.....235
Pepo.....236
Physostigma.....236
Phytolacca.....240
Pilocarpus.....243
Pimenta.....245
Piper.....246
Podophyllum.....248
Prunum.....257
Prunus Virginiana.....257
Pyrethrum.....259
Quassia.....259
Quercus.....261
Quillaja.....262
Resina Podophylli.....250
Rhamnus Purshiana.....263
Rheum.....267
Rhus Glabra.....271
Rosa Gallica.....272
Rubus Villosus.....276
Sabal.....277
Sabina.....278
Saccharum.....278
Salvia.....280
Sanguinaria.....282
Santalum Rubrum.....285
Santonica.....287
Sarsaparilla.....288
Sassafras.....289
Scammonium.....297
Scilla.....298
Scoparius.....299
Scopola.....299
Scutellaria.....301
Senega.....317
Senna.....318
Serpentaria.....319
Sinapis Alba.....319
Sinapis Nigra.....320
Spigelia.....321
Staphisagria.....321
Stillingia.....322
Stramonium.....323
Strophanthus.....326
Styrax.....331
Sumbul.....332
Tamarindus.....332
Taraxacum.....334
Terebinthina.....335
Thymol.....336
Tragacantha.....337
Triticum.....338
Ulmus.....338
Uva Ursi.....339
Valerian.....339
Vanilla.....340
Veratrum Viride.....350
Viburnum Opulus.....352
Viburnum Prunifolium...353
Xanthoxylum.....354
Zea—Stigmata Maydis...355
Zingiber.....355
Bibliography.....357
Index to Personal Names.425

Digitized by Google

LIST OF ILLUSTRATIONS

Facing page

STAR ANISE TREES 16

SASSAFRAS DISTILLATION 16
Presented by Fritzsche Brothers.

ATROPA BELLADONNA CULTIVATION 28
Presented by Eli Lilly and Company.

ATROPA BELLADONNA CULTIVATION 30
Presented by Johnson & Johnson.

CANNABIS SATIVA (AMERICAN GROWN) 40
Presented by The Norwich Pharmacal Company.

THE COCA COUNTRY, COLOMBIA, SOUTH AMERICA 84

COCA MARKET, COLOMBIA, SOUTH AMERICA 96

COCA-USING INDIANS ON CREST OF ANDES MOUNTAINS, COLOMBIA, SOUTH AMERICA 88

TYPICAL CONNECTICUT BIRCH OIL DISTILLERY 148

NEAR NEW LONDON, CONNECTICUT 148
Presented by The William S. Merrell Chemical Company.

TURKS DIGGING LICORICE IN THE VALLEY OF THE MEANDER. (*Old Roman Road in Background.*) .. 152

TURKS EATING LUNCH. (*Licorice in Background.*) 152

NIOBE WEEPING FOR HER CHILDREN 154
This heroic figure of "The Sorrowing Mother," carved on the mountain top, antedates history. It overlooks the valley of the Meander, noted for wild licorice.

VALLEY OF THE MEANDER 154
Historically celebrated from all time.

Digitized by Google

Facing page

HYDRASTIS CANADENSIS..... 164
Presented by H. K. Mulford Company.

PLOWBOY IN OPIUM FIELD, TURKEY..... 226

TURKS INSPECTING OPIUM. (*Warehouse of A. Keun & Co., Smyrna, Turkey.*)..... 226

RHAMNUS PURSHIANA (CASCARA SAGRADA)..... 264
Presented by Parke, Davis and Company.

TURKS IN ROSE FIELD NEAR BRUSSA..... 272

ROSE WATER STILL, NEAR BRUSSA..... 272

FRONT VIEW, ROSE OIL STILL, NEAR BRUSSA..... 272

BACK VIEW, ROSE OIL STILL, NEAR BRUSSA..... 272

OLIVE ORCHARD ON ROAD TO BRUSSA, NEAR MOUNT OLYMPUS..... 300

AGED OLIVE TREE NEAR MOUNT OLYMPUS, BRUSSA, 300

MULBERRY TREES STRIPPED FOR SILK WORMS..... 340

MULBERRY LEAVES FOR FEEDING SILK WORMS..... 340
Near Brussa, on the foot of Mount Olympus, a city of silk industry.

COLLECTING PERSIAN INSECT FLOWERS..... 352
Presented by Allaire Woodward & Company.

Digitized by Google

PHARMACOPEIAL DRUGS

ACACIA (Gum Arabic)

Official in all editions of the *U. S. Pharmacopeia*, from the first edition, 1820, to that last published, 1910. The 1910 edition limits the use of the gum to that obtained from *Acacia Senegal*, Willdenow, and other African species of acacia.

From the most remote records of antiquity, acacia has been an article of commerce. The tree was pictured, together with heaps of the gum, in the reign of Rameses III, of Egypt. Mention of the gum is of frequent occurrence in Egyptian inscriptions, where it is referred to as the Gum of Canaan. Theophrastus (633), in the 3d and 4th centuries B. C., described it, as also did Dioscorides (194) and Pliny (514), under the name "Egyptian Gum." Acacia was exported from the Gulf of Aden, seventeen hundred years before Christ. It has thus been employed from all recorded time in both domestic medicine and commerce. It was used by the Arabian physicians,[1] and by those of the renowned schools of Salerno. During the Middle Ages, acacia was obtained from Egypt and Turkey, being an article of commerce in the bazaars of Constantinople, 1340 A. D. As early as 1521 A. D. it was distributed through Europe, from Venice. Among the most interesting and

[1] "On the morning of our separation it was as if I stood in the gardens of our tribe,
Amid the *acacia shrubs* where my eyes were blinded with tears by the smart from
the bursting pods of *colocynth*." *From the oldest of* "THE HANGED POEMS."

The "*Seven Hanged Poems*" were so named from the fact that these seven poems, *and these only*, were considered worthy of "*hanging*" on the walls of the "Sacred Temple of Mecca." They were heirlooms of Arabian poetry, when at its highest. The date at which the poem was composed from which the above couplet is taken, is unknown. From *The Sacred Books and Early Literature of the East*, edited by Prof. Charles F. Horne, Ph.D., we take the following tribute: "It was unanimously agreed to immortalise their fame by conferring on them the highest honor the followers of Mohammed could bestow, that of hanging them inside the Kaaba, the most sacred shrine of their worship, as a memorial to posterity." Note the linking together of the tears (gum) of the acacia and the acrid juice of the colocynth.

Digitized by Google

instructive recent contributions to acacia literature, is the *Report of the Wellcome Research Laboratory*, Khartoum, (678), 1904. Even this, however, is excelled in the magnificently illustrated "Third Report" from that institution, presented in 1908, in which we find a fund of information that forbids even summarizing. Pages 414 to 450 present, exhaustively, the subject of gums, whose origin, as might be anticipated, is found due to bacterial infection. The reports are not altogether concordant, trees artificially inoculated even falling below the yield by native processes, as shown by the following extract:

"INOCULATION.—In view of the results of Greig Smith's investigations, which appear to prove that gum is formed as the result of infection of the sap by a microbe resident presumably in the bark, and also that extensive removal of the bark is undesirable, an experiment was carried out as follows: Tapping was performed by making a series of gashes with an axe, no bark being stripped off, and (as the chances of efficient natural inoculation might thus be lessened), an attempt was made to ensure the entrance of the microbe by rubbing a moist rag over the bark and subsequently into the cut. A series of trees tapped in the native fashion (by stripping the bark) was treated in the same manner for comparison. The following table exhibits the results obtained:

Garden of	Number of trees operated upon	Size of trees	Method of tapping	Inoculated	Yield of gum per tree
Adam Afifi	25	Medium	Ordinary	Not inoculated	0.9 rotl.
"	25	"	"	Inoculated	0.55 "
"	25	"	Short Gashes	Not inoculated	0.28 "
"	25	"	" "	Inoculated	0.14 "

Digitized by Google

"This quite unlooked for result is not without significance of practical value. It goes to show that the yield of gum is affected to a very great extent by conditions other than the mere stripping of the bark. The explanation of the lower yield may be that inoculation takes place ordinarily by the microbes falling upon the sap which exudes in slight quantity when the bark is stripped off, and that when the water was rubbed over the bark and then into the cut the effect was rather to wash away this sap and render inoculation less complex and effective." *Third Report of the Wellcome Research Laboratories at the Gordon Memorial College, Khartoum*, 1908.[1]

ACONITUM (Aconite)

Official in all editions of the *U. S. P.* from 1820 to 1910.

Aconite, *Aconitum Napellus*, was familiar to the ancients as a poisonous plant. It was used by the ancient Chinese as well as by the hill tribes of India. In a work published by the Welsh MSS. Society, 1861, titled, *The Physicians of Myddvai*,[2] it is designated as "a plant that every physician should grow." Aconite is native to the Alps and the Pyrenees, as well as to the mountains and highlands of Germany, Austria, Denmark and Sweden. The whole of Siberia, and the Himalaya Mountains, to the altitude of 16,000 feet, are said to harbor the plant. Waring (669) states that it is found in Northern India, and Dymock (208) gives

[1] It should be stated that Greig Smith (*Proc. Linn. Soc. of N. S. W., 1902*, Part III, Sept. 24th), is the original investigator of the bacterial origin of acacia, and has published several papers on the subject. These should be studied in connection with the Wellcome Report.

[2] PHYSICIANS OF MYDDVAI. The domestic physician of Rhys Gryg, prince of South Wales who died 1233, made a collection of recipes used in medicine at that date in his country. He was assisted by his three sons, the collection being a valuable historical record concerning remedial agents and methods of that date. Of this work, two compilations have been issued, the two appearing together, 1861, with a translation by John Pughe (470 pp.). The original manuscript is in the British Museum. (See Flückiger and Hanbury's *Pharmacographia*, page 761).

Digitized by Google

the various names applied to the drug, stating that "it is important in Sanskrit," and that of the eighteen varieties of aconite mentioned by Hindu writers, ten were considered too poisonous to be used in medicine. Indeed, under the Sanskrit term *Visha*, and its equivalent *Bish* and *Bikh*, of modern Indian languages, aconite was accepted as "the most virulent poison known." Everywhere it is known to the common people as a poison. Störck, of Vienna, (617), introduced the drug to the medical profession in 1763, and from that date it crept into European dispensatories, and from thence into general practice. Aconite, in small doses, is a great favorite with American physicians.

ALOE (Aloes)

Official in all editions of the *Pharmacopeia*, 1820-1910. As official sources of aloe, the *U. S. P.*, 1910, names *Aloe Perryi*, (Socotrine aloes), *Aloe vera*, (Curaçao aloes), and *Aloe ferox*, (Cape aloes).

The name aloe embraces a large number of succulent-leaved plants native to tropical countries. Most of these have showy flowers, and many are cultivated in hot-houses. The official variety, *Aloe socotrina*, "grows in the Indies, and especially in the island of Socotra." (*Lam.*)

The early history of the aloe plant is much obscured by the fact that the name aloe, for example as it occurs in the Bible, relates to a substance entirely different from the inspissated juices of the various species of the modern aloe plant, with which it has nothing in common, except its bitterness. The aloe of the Bible is the *wood* of *Aquillaria agallocha* (Roxburgh), or *lignaloes*, which was used among ancient nations as an incense, and highly prized on account of its scarcity. References

Digitized by Google

to this substance thread the *Arabian Nights*, (Burton's Translation). The following excerpts from that well-known publication show conclusively that "aloes" of the present day could not have been the "Ligna Aloes" of past Oriental lore:

"Furthermore, they decorated the cities after the goodliest fashion and diffused scents from censors and burnt *aloes-wood* and other perfumes in all the markets." Vol. X: p. 56.

"Then the barber made him sit on the dais and the boys proceeded to shampoo him, whilst the censers fumed with the finest *lign-aloes*." Vol. IX: p. 150.

That the substance named could not have been a *mixture*, is illustrated by the following:

"So I bade them set before him a box containing *Nadd* [a mixture, *Burton*] the best of compound perfumes, together with fine lign-aloes, ambergris and musk *unmixed*."

By modern writers, the aloe plant is considered to have grown wild in India from a very remote period. It was probably introduced into that country by the Arabs, the disseminators of knowledge concerning the medicinal virtues of plants. Aloes was employed by Galen (254 a), and was described by the Greek and Roman writers of the first century, chief among whom were Dioscorides (194) and Pliny (514), whose descriptions of this drug and its uses, however, bear much resemblance to each other.

Socotrine aloes appears to have acquired its reputation at an early date. Clusius (153), in 1593, reports that Mesuĕ, the Arabian pharmaceutical writer, "the father of Pharmacopœias," (who died about 1028 A. D.), knew of the Socotrine origin of aloes, mentioning

Digitized by Google

Persia, Armenia and Arabia as sources of aloes of commerce. Ibn el Beithar (214) speaks of aloes from the island of Socotra as being superior to that of the Arabian districts of Yemen.

The name *Aloe socotrina* was undoubtedly derived from the island of Socotra, off the entrance to the Red Sea. Yet, some authors maintain that the name was by some given to the inspissated juice of aloe (*succus citrinus*), on account of the lemon-yellow color of its powder.[1] Not all the earlier medico-pharmaceutical writers who afterwards considered the drug refer to socotrine, or any other special kind of aloes. Hieronymus Bock (82), 1556, merely alludes to the drug being brought from India and Arabia, a statement already found in Dioscorides. He relates an instance where the aloe plant is cultivated in Germany as an indoor ornamental plant, under the name *sempervivum*.

Samuel Purchas (527), however, in his important collection of travels, 1625, gives prominence to Socotrine aloes, and places on record the commercial transactions of British merchants with the king of Socotra. One of his contributors, (William Finch, merchant), gives the following interesting information, which he gathered about 1607 A. D., concerning the preparation of aloes in the island of Socotra:

"I could learne of no merchandise the iland yeeldeth, but Aloes, Sanguis Draconis, and Dates and, as they say on the shore of Aba del Curia, Blacke Ambergreese. Of Aloes I suppose they could make yearly more than Christendome can spend, the herbe growing in great abundance, being no other than *Semper vivum*, in all

[1] Usage accepts that *Aloe succotrina* is the plant described by Lamarck, and that *aloe socotrina* is the commercial extract derived from certain species of aloes. Exceptions in the spelling of the latter word have occurred in older Pharmacopeias.

Digitized by Google

things agreeing to that description of Dioscorides in seed, stalke, etc. It is yet all of a red pricklie sort, and much chamfered [1] in the leaves, so full of a resin-iuyce that it is ready to breake with it. The chiefe time to make it, is when the winds blowe northerly, that is, about September, and that after the fall of some raine, which being then gathered, they cut in small pieces, and cast into a pit made in the ground, well cleansed from filth and paved; there it lieth to ferment in the heat of the sunne, whereby it floweth forth. Thence they take and put it in skinnes, which they hang up in the wind to dry, where it becommeth hard. They sold us for 20 Rials a Quintall which is 103 pounds English, but we were after told that they sold to others for 12, which considering the abundance and easie making, may be credible."

Elsewhere the statement is made that "the Aloe of Socotra exceedeth in goodnesse that which is gathered in Hadhramut of the land of Jaman, Arabia, or anywhere else."

From the same authority we learn that 1800 pounds of Socotrine aloes were bought at one time, and 2722 pounds at another.

The ancient trade of the island has never increased, and in 1833, we are informed, only two tons were exported. At present the manufacture and export seem to have ceased altogether, due no doubt to unfavorable local conditions, as well as to the intrusive competition of other countries. In the 16th century, or perhaps before, the aloe plant was introduced into the West Indies, Lignon, (383) 1763, dwelling especially on its having occurred in Barbados as early as 1647-1650,

[1] Grooved.

Digitized by Google

which is only about twenty years after the English came into possession of this island (365). From this point aloes soon became an article of export, appearing in the London market in 1693 (239). In this connection, however, it is strange that J. B. Labat (365), a French monk and careful observer of nature, who visited the island of Barbados in 1700, fails to mention Barbadoes aloes among its staples (365). He says: "Formerly much tobacco was planted, and subsequently ginger and indigo; cotton is now grown up in some parts of the island, but sugar is at present the only article to which attention is devoted."

That this omission of aloes by Labat could not be from ignorance, is shown by his careful reference to aloes when, twenty-eight years afterwards, 1728, he refreshingly described the resources and people of Senegambia on the west coast of Africa (365), and strongly advocates the use of aloes that might be made from aloe plants grown in abundance in that district, in place of aloes from the island of Socotra which, in his opinion, possessed an imaginary superiority, only "because it comes from afar, and costs much." The three commercial forms of the drug then known, *Socotrine, hepatic* and *caballine aloes*, Labat ascribes to one and the same origin, the differences resulting only from the mode of preparation, caballine "or horse aloes, the lowest grade, being made from refuse material."

In all this, Barbadoes aloes is not mentioned by Labat. Whether this neglect is due to interruption of cultivation, or to some other cause difficult to determine, may never be settled. It is established, however, that Barbadoes aloes was exported from the island

Digitized by Google

both before, and soon after these reports. Samuel Dale, in 1751, expressly states (179) that aloes is brought to England in large gourds from the island of Barbados, and that the inspissated juice has the properties of *Aloe socotrina*.

From Cape Colony, Africa, where aloes was made by Peter Van Wett, (239), aloes has been an article of export since 1773.

Curaçao aloes was known in the Dutch market in 1847, and appeared in the English market for the first time, as late as about 1876. The following, by the author of this research, was published in *The Western Druggist*, Chicago, in 1898:

Cultivation, Preparation and Commercial Varieties

"The aloe plant, wherever it is cultivated, requires but little care. It will thrive in almost any soil, and in a wild state is known to be abundant on arid plains, as *e. g.* in the interior of Cape Colony. In this connection, Mr. P. L. Simmonds' (599) book on *Economic Products of the Vegetable Kingdom*, although written in 1854, contains much valuable information that holds good today, concerning the cultivation and preparation of aloes, as well as statistics regarding all kinds of aloes known at that date.

"The usual mode of aloe propagation is by sprouts, the only care required being to keep down the weeds. In Barbados, Mr. Simmonds relates, great care is taken to pick the stones from the ground, the plants being then set in rows one foot apart to facilitate the removal of weeds. The aloe is planted usually between April and June, and is so hardy that it will live for many weeks without a drop of rain. The collection is made

Digitized by Google

in March, following. The plants thrive for ten to twelve years if good manure is used every three or four years. Similarly the aloe plant (*Aloe vulgaris, var. chinensis*), is now cultivated in the Dutch island of Curaçao. No fertilizer whatever is required, nor any preparation of the soil. The young plants thrive even though the roots have to work their way between stones. When sufficient rain falls, abundant juice is produced, and many young sprouts are formed around the mother plant. They are sold by the thousand on the Curaçao market.

"Mr. Simmonds in the same work described the mode of preparation of aloes, as observed by him in the West Indian Islands and also as it is conducted in Cape Colony.

"A more recent report on the collection and treatment of the aloe in the island of Curaçao, by Mr. E. M. Holmes, (322), in the *Pharm. Jour. Trans.*, Vol. XX, 1889-1890, p. 561, and Vol. XXI, 1890-1891, p. 205, gives the following details:

"The aloe plants are cut after sufficient rain has fallen, the time being selected so as to obtain a juice that is neither too watery, as is the case after much rain, nor too thick, as is the result in the dry season. In Aruba the cutting is done by men, in Curaçao and Bonaire by women. The operator seizes the crown of the leaves with one hand, and by one horizontal stroke with a broad knife, severs them from the base of the stem. The leaves are at once placed, base downward, in sloping wooden troughs, which are open at one end. The exuding juice is collected in tin vessels which when filled are emptied into barrels. The abstracted leaves are then spread on the ground, and when dry are oc-

Digitized by Google

casionally used as fodder for animals, but more often as a fertilizer. When the aloe field has its own brick furnace, the juice is at once boiled down in a large copper kettle heated by direct fire. The mass is stirred constantly, and when it has reached a certain consistence, is ladled into wooden casks where it is allowed to cool, and then the mass is prepared for shipment. When there is no furnace in the field, however, the barrels of juice are hauled to special 'boiling houses,' where the boiling is conducted after a sufficient number of barrels have arrived. If the amount of juice is not sufficient to warrant boiling, the aloe juice is sometimes left for weeks, and as a result fermentation has been known to take place, certainly to the detriment of the commercial product, although it has been asserted that aloe juice is not liable to ferment.

"In Aruba there is only one boiling house that evaporates the juice by steam instead of by direct fire, where, as Mr. C. G. Lloyd learned on his journey through the West Indies, the vacuum pan is now employed. This place seems increasingly to supply the bulk of the Curaçao aloes, as the following table of exports from the Dutch West Indies from 1884 to 1887 would show:

	1884	1885	1886	1887	
Curaçao	.....	2,080	500	.....	kilograms
Bonaire	19,083	5,821	18,640	2,075	"
Aruba	98,960	123,115	158,011	189,925	"

"It has been customary in trade circles to distinguish by name *Socotrine*, *Barbadoes*, *Curaçao*, and *Cape aloes*, as well as certain commercial forms of minor importance, such as *Natal*, *Indian* and *Mocha aloes*.

"The term *hepatic aloes* has been employed to classify

Digitized by Google

any aloes of a liver-color, regardless of its geographical origin.

"Professor Tschirch (653) distinguishes between the crystalline aloes (*aloe hepatica*), prepared at lower temperatures, and the transparent variety (*aloe lucida*), prepared at a higher heat, which more or less precludes crystallization, as shown in Cape aloes. The botanic origin of these commercial products, however, is not always precisely known, e. g., the exact plant used in making Natal aloes or Socotrine aloes. Yet, even if they are produced by different varieties of the aloe plant, their marked differences in appearance, odor and composition can hardly be attributable to this factor alone. It is safe to say that the manner of collection and the care bestowed upon the juice, as well as its subsequent manipulation, influences the character of the commercial product, regardless of the aloe plant yielding it. Dr. Squibb (610a), for example, who champions purified aloes, admits that so simple a process as that of purification of the commercial drug alters it to some extent.[1]

"Commercial Socotrine aloes is now collected from the coast countries of the Red Sea and Zanzibar, and occurs sometimes in a semiliquid state, which is due to imperfect inspissation. It is exported from Bombay and Zanzibar, the bulk of the product being consumed in the United States. That shipped from Bombay is previously received via Zanzibar and the Red Sea ports, and arrives in skins of varying sizes, which are opened and repacked into boxes for exportation.

[1] This, according to our experience, applies to many drugs and plant extractives. A plant crudity may be "purified to death." Interlocked structures that lean upon each other as a whole, or are entwined physically so as to present a united influence, when shattered by heroic chemistry, may not, in any educt or product, parallel the parent structure.

Digitized by Google

"The Socotrine aloes of ancient times is not now found in trade, and according to Squire, (*Companion to the British Pharm.*, 16th ed., London, 1894), exists only as museum specimens. It was derived from a species of aloe indigenous to Socotra, rediscovered in 1878, and named *Aloe Perryi* by Baker, after Commodore Wickham Perry, (not the Commodore Perry of Lake Erie fame), who for the purpose of identification carried a specimen of the plant from the Island of Socotra to England.

"The description of commercial Socotrine aloes may be found in any modern work on pharmacognosy; also see in this connection the article by Dr. A. R. L. Dohme in the *Druggists' Circular*, 1897. The Zanzibar (hepatic) variety is brought to us in monkey skins of a capacity varying from 20 to 30 or 40 pounds. A writer in the London *Chemist and Druggist* says on this point, that this peculiar mode of wrapping the parcels suggested itself on account of the abundance of these animals in Zanzibar, and the ease with which they can be killed.

"Barbadoes aloes is no longer manufactured in Barbados, (*Chem. and Druggist*, 1897, Vol. 51, p. 465), its place in trade being taken mainly by Curaçao aloes.

"Curaçao aloes has suffered a gradual decline in price, falling from 11 cents a pound in 1883 to 3 cents and less even at present, (1898), owing to excessive shipments made during this interval; but, as Dr. Dohme has shown (*Amer. Journ. Pharm.*, Aug., 1898, p. 398), that this species is rich in aloin (18.5 per cent., against 7.5 per cent. of Socotrine and 4.5 per cent. of cape aloes), Curaçao aloes may have a future, notwithstanding the disagreeable odor which it possesses, provided *aloin* is demonstrated to be the only active principle of

Digitized by Google

the various aloes of commerce. In contrast with the present unpleasant odor of this form of aloes, A. Faber, in 1847, stated that Curaçao aloes (of the Dutch market) has a 'beautiful saffron-like odor.' (*Pharm. Jour. Trans.*, Vol. VII, 1847, 48, p. 547).

"Cape aloes is distinguished from all others by its appearance and by being translucent at the edges; it yields a brown-yellow powder. This is the favorite aloes in Germany, and is the variety most soluble in water and alcohol. Messrs. Bainbridge and Morrow have found a specific test for this aloes as follows: When treated with nitric acid, on a white plate, cape aloes, like others, (except Socotrine aloes), yields a red color; but after five minutes' standing, cape aloes changes to a rather permanent green."

ALTHÆA (Althæa, Marsh Mallow Root)

Althæa Root. Introduced in *Pharm.* 1830, (New York ed). Continued through 1910.

Althæa Flowers. Introduced in 1830, (New York ed.). Not mentioned in 1840. Official in *Pharm.* 1850, both editions. Not mentioned thereafter.

Althæa officinalis, known to us as marshmallow, was described by Dioscorides (194) under the Greek name signifying *to heal*. It has been used in domestic medicine from the earliest periods. Charlemagne, 742–814 A. D., demanded that it be cultivated in his domain. Althæa grows throughout Europe, Asia Minor, western and northern Asia and adjacent districts, and although of little consequence in physicians' use is more or less employed in domestic medication in all localities. Its domestic use introduced this demulcent drug to early professional medication.

Digitized by Google

AMYGDALA AMARA (Bitter Almond)

Amygdalus communis official from 1820. Variety *amara* first recognized in 1840. Continued thereafter till 1900. Dropped from *Pharmacopeia* of 1910.

The seeds of bitter almonds, *Prunus Amygdalus*, var. *amara*, known in the days of antiquity to be poisonous, were yet used medicinally throughout the Middle Ages. Valerius Cordus (169) employed them as an ingredient of trochisci. They are referred to by Scribonius Largus (589) in the century preceding Christ. Their poisonous qualities were shown by Bohm of Berlin to depend on hydrocyanic acid, at the beginning of the last century. Bitter almonds have never been a favorite in domestic medicine, although, as above stated, they were originally used in that direction. They have been scarcely more a favorite with licensed physicians.

AMYGDALA DULCIS (Sweet Almond)

Official, as *Amygdalus communis*, in the first edition of the *U. S. Pharmacopeia*, 1820. The variety *dulcis* was first recognised in the New York edition of 1830, but was not named in the Philadelphia edition of that year. Following 1830, both sweet and bitter almonds were official in all editions until 1910, when *Amygdala Dulcis* became *alone* official, excepting in such preparations as the oil, spirit, or water of bitter almonds.

The almond, *Prunus Amygdalus dulcis*, was one of the trees mentioned in the Old Testament, it being one of the fruits mentioned, Genesis 43:11, which the patriarch Israel commanded his sons to carry from Palestine as a present to Egypt. Theophrastus (633) makes copious references to the almond, and its name threads the stories of the *Arabian Nights*, as illustrated by the following:

"O dear son, be not like the almond-tree which leafeth earlier than every growth and withal is ever of

Digitized by Google

the latest to fruit; but strive to resemble the mulberry-tree which beareth food the first of all growths and is the last to put forth foliage." [1] Burton's Translation, Vol. XVII: p. 7.

"He heard a sound of singing, the like whereof he had never heard in the world, for that it was soft as the breeze and more strengthening than *Oil of Almonds*." Vol. XI: pp. 74-5.

In connection with spices and groceries, the almond was mentioned in a charter granted the monastery of Corbis, in Normandy, by Chilperic II, king of France, 539–584 A. D. Charlemagne, 812 A. D., wisely ordered the almond tree introduced on the imperial farms. The almond became an important item of Venetian trade in the 14th century. In 1411, the Knight Templars of Cyprus (Flückiger) taxed almonds, honey and sesame seed. Medieval cookery consumed almonds in enormous quantities. As a nourishing food in the form of an emulsion, almonds crept into domestic medicine, and thence into professional use.

— ANISUM (Anise, Aniseed)

Official in all *Pharmacopeias* from 1820 to 1910, excepting the New York edition of 1830, which omits the drug, but names the *oil*.

This drug, *Pimpinella Anisum*, is among the oldest known medicines and spices. Theophrastus (633) and later writers, such as Dioscorides (194), Pliny (514) and Edrisi (221), mention it. Charlemagne commanded that it be cultivated on the imperial farms in Germany. Its ancient source was Egypt and the island of Crete. It was one of the drugs enumerated by Edward I, 1305, to be taxed when carried across the

[1] Every work consulted exemplifies the close observation of Nature by the Orientals, past and present.

Digitized by Google

Upper. STAR ANISE TREES (Page 16)
Lower. SASSAFRAS DISTILLATION (Page 289)
Presented by Fritsche Brothers.

Digitized by Google

Digitized by Google

Bridge of London. Anise is mentioned in the expenses of King John of France, 1319–1364, during his abode in England. The Grocers' Company of London had its oversight, 1453. The Royal Wardrobe of Edward IV, 1480, was perfumed thereby. It was used in England as a pot herb prior to 1542, and during the reign of Charlemagne it was enormously taxed. Throughout all this period anise was employed both as a spice and as a domestic medicine.

ANTHEMIS (**Anthemis, Chamomile**)

Official from 1820 to 1900. Dropped from *Pharmacopœia* of 1910.

Anthemis nobilis has been cultivated for centuries in English gardens, and from the beginning of the records it has been used in domestic medicine. It was introduced into Germany from Spain about the close of the Middle Ages. It is now grown in favorable localities throughout every section of Europe, and especially in Saxony, as well as in Belgium and France. The name *Roman Chamomile* was given the drug growing near Rome, by Joachim Camerarius (120), 1598.

APOCYNUM ("**Indian Hemp,**" "**Canadian Hemp**")

All editions of the *U. S. P.* excepting that of 1910 recognize Apocynum, but until 1880 it appears only in the Secondary List. The early editions, 1820, 1828 and 1830 (New York), give place only to *Apocynum androsæmifolium*, "Dogsbane," a variety now so rare that it can scarcely be obtained, even as a museum specimen. The variety *Apocynum cannabinum*, "Indian Hemp" is mentioned first in the Philadelphia edition of 1830. This, like all editions following, until 1870, carries *both* varieties. The 1880 edition limits *Apocynum* to the variety *cannabinum*, which it designates as "Canadian Hemp." This limitation is followed in 1890, while the edition of 1900 admits "*Apocynum cannabinum* and closely related species of Apocynum."

"American Indian Hemp" is the name given to possibly a score of closely related plants, all known as

Digitized by Google

Apocynum cannabinum, this common name being used in contradistinction to the true "Indian Hemp," of India, *Cannabis indica*. The name "Indian Hemp" was given to this plant by the early settlers because of its bark, which, of a fibrous character, was in domestic use by the American Indians. Since the days of the earliest settlers, who learned its qualities from the Indians, the root of apocynum has been used in decoction as an active hydragogue cathartic and also as a diuretic. As a remedy in "dropsy" it was extensively employed in home medication, and was thus introduced to physicians concerned in remedial agents of American origin. Its favor with physicians engaged in general practice, led finally to its introduction to the pages of the *Pharmacopeia*. For nearly a hundred years, Eclectic literature as well as that of American botanics has been prolific in the praises of apocynum, as shown by all their publications; note especially all revisions of the *American Dispensatory*, (356). In their early practice, apocynum was often called "The Vegetable Trocar." In 1909, Dr. Frederick B. Power and Charles W. Moore, of the Wellcome Research Laboratories, London (677), presented a special and very scientific treatise on the Apocynum constituents.

ARNICA (Arnica)

Arnica montana is official in all editions of the *Pharmacopeia*, but until 1860 it is mentioned only in the Secondary List. A wide divergence appears as regards the part used. The early editions name "The plant," and give as the common name, "Leopard's Bane." The 1840 edition mentions "The root and herb of *Arnica montana*." In 1850 we find the common name, Leopard's Bane, used for the last time. This edition is notable for mentioning, *for the first time*, Arnica *flowers*, neglecting all other parts of the plant, a ruling followed by all later editions, although the editions of 1880 and 1890 admit arnica *root*, as well as Arnica flowers. The editions of 1900 and 1910 give place to the flowers only.

Digitized by Google

All parts of this plant, *Arnica montana*, were popular remedies in Germany at a very early period. The early botanists, such as Matthiolus (414), Gesner (264) and Clusius (153), had a knowledge of its medicinal qualities, as used by the common people. Franz Joel (341), of Greifswald, Germany, expressly recommended it in the 16th century. During 1678–79, arnica experienced an enthusiastic European crusade as a "new remedy" in the cure of fevers, the hope being to supplant imported Peruvian bark by this domestic drug. Collin (162), of Vienna, reported a thousand patients in the Pazman Hospital cured of intermittents by the flowers, whilst other physicians were scarcely less enthusiastic in their praises. The herb was recognized in the *London Pharmacopeia*, 1788, but fell into disuse, regaining in later years a position as an application in the form of a tincture for bruises, sprains, etc., in which direction it is yet commended in both domestic and professional modern literature.

ASAFETIDA (Asafetida)

Official in all editions of the *U. S. P.*, from 1820 through 1910. As official sources for the gum, the *U. S. P.*, 1910 edition, names *Ferula Asafœtida*, *Ferula fœtida*, and "some other species of *Ferula* indigenous to Persia and adjacent countries."

Under the name "Laser," a substance supposed to be asafetida, *Ferula fœtida*, has been from all time used in India and Persia, and thence long exported, a duty being at a very early date levied thereon at the Roman Custom House in Alexandria. Under the name *Hingu* it is mentioned in Sanskrit works as well as in Susruta (622). Arabian and Persian travelers of the Middle Ages knew it. Ali Istakhri (337), of ancient Persepolis, states in the 10th century that it was abundantly pro-

Digitized by Google

duced between Sistan and Makran, of Beluchistan, and was used by the people as a condiment. It has ever been employed in Arabic therapy, Matthæus Platearius (513), nearly a thousand years ago, mentioning it in his work on simple medicines, *De Simplici Medicina*. Otho of Cremona, near that period, states that the more fetid the drug, the better its qualities. The "*Physicians of Myddvai*," (507), (see footnote to *Aconite*), valued it highly. Briefly, this drug drifted into European conspicuity from the Orient, where it had been used empirically from the remotest antiquity. For centuries, every work on domestic or professional medicine has given asafetida a setting. On this subject, see also an article in the *Pharmaceutical Review*, March, 1896. As might be expected, Dymock, *Pharmacographia Indica*, Vol. II, goes deeply into the history of asafetida, his description and history covering several pages. From this great work we extract, as follows:

HISTORY.—"The old Greek and Latin writers on Materia Medica mention two kinds of *Silphium*—one good or sweet, and the other fetid. Theophrastus in his History of Plants, (vi, 3) speaks of two varieties, *of the stem* and *of the root*. Dioscorides mentions two kinds, one coming from Cyrene and the other from Asia. Some consider the silphium of Cyrene to have been entirely different from our Asafetida, but from a passage in Strabo this does not appear to have been the case. Pliny's account is very confused, but he has collected some information which we now know to be correct. N. Myrepsicus appears to be the first writer who mentions the name *asafitida*, which he says is an Italian name for the *skordolasaron* of the Greeks of his day. In the Rudens of Plautus, (B. C. 220), the scene

Digitized by Google

of which is near Cyrene, frequent allusion is made to the growth of Laserpitium, and the preparation and export of the gum-resin, as forming the staple article of trade. The Greek and Latin writers agree in saying that the *silphium* or *laser* of Cyrene was the best, but from the works of Pliny we find that it was almost unobtainable in his time, relating that a single plant was presented to the Emperor Nero as a curiosity. The gum resin of *F. alliacea* is the *Hing* of the natives of India, the other kind being seldom used by them. In Sanskrit it is called Hingu, and is said to be so called from its killing or overpowering all other odors.

"Asafetida must have been used in India from a very remote period, as the earliest Sanskrit writers mention it. The plant is called Jatuka, a word derived from Jatu, 'gum or lac;' it is described as a fragrant plant, in great repute as a condiment among vegetarians, also as an antispasmodic in nervous affections; taken daily it was thought to ward off attacks of malarial fever. Hindu medical writers direct that it be fried before being used.

"Of the Mahometan writers on Materia Medica, Ibn Sina mentions two kinds of Asafetida, 'good' and 'fetid,' but gives no description of them. Ali Istakhri, who also lived in the 10th century, states that the drug is produced abundantly in the desert between Sistan and Makran, and is much used by the people as a condiment. The geographer Edrisi, who wrote about the middle of the 12th century, asserts that Asafetida, called in Arabic Hiltit, is collected largely in Western Afganistan. Haji Zein the druggist, in the 14th century, tells us that the two kinds of asafetida are produced by two different plants, the black and the white Anjudan,

Digitized by Google

and that the latter produces the kind known as 'good.' Mir Muhammad Mumin of Shiraz, who wrote in the 17th century, says that 'good' asafetida has a reddish color, and is produced by a plant vulgarly known as cap-leaf, while the other has a disagreeable odor like a leek, and is known as 'stink-finger.' In describing the medicinal properties of the drug, the Mahometan physicians closely follow Dioscorides.

"The flowering stems of the asafetida plants are eaten as a vegetable, as stated by Pliny. Aitchison, who traveled in Eastern Persia in 1884-5, notices their use for this purpose, and Dr. Peters forwarded to us the flowering stem of *F. fetida*, Regel, which he had purchased in the bazar at Quetta.

"Guibourt (1850) was the first European writer to point out the difference between the Asafetida of India known as *Hing*, and that of the European Pharmacopeias called in India *Hingra*. Vigier, 1869, calls *Hing* Asafetida nauséeuse. To Mr. Ardeshir Mehrban, a merchant of Yezd, we are indebted for most of the following particulars regarding the source of this drug. Mr. Ardeshir, having himself visited the hills where the plant grows, was able to speak from personal observation. He states that the Asafetida plant grows wild on the hills of Khorasan, in very stony ground. The hill men collect the gum-resin, taking an advance from the merchants. The time for collecting it is in the spring. The plant is not nearly as large as that which produces the asafetida of European commerce, the diameter at the crown of the root being seldom more than two inches. The collectors protect each plant by building a small cairn of stones round it; they also remove the soil from the upper portion of the root, making a kind

Digitized by Google

of circular basin. When the stem begins to grow it is cut off, and the upper part of the root being wounded, a small quantity of very choice gum is collected, which seldom finds its way into the market. Afterwards a slice of the root, about ¼ inch thick, is removed every two or three days with the exudation adhering to it, until the root is exhausted. The collected mass, consisting of alternate layers of root and gum resin, when packed in skins (in quantities of about 100 lbs.), forms the *Hing* of Indian commerce."

— ASPIDIUM (Male Fern)

Introduced in 1830 under the name *Filix Mas*, (*Aspidium Filix mas*), this substance appears in both editions of the 1830 *U. S. P.*, (Philadelphia and New York), but is mentioned in the Secondary List, only, until 1860, when it was transferred to the Primary List. In 1880 it became official under its present title, (*Aspidium*), which it holds in all subsequent editions. The species of aspidium official in the 1910 edition is *Dryopteris Filix-mas*, (Linné) Schott, or *Dryopteris marginalis*, (Linné) Asa Gray.

The root of aspidium, *Dryopteris Filix-mas*, was used by the ancients as a vermifuge. Theophrastus (633), Dioscorides (194) and Pliny (514) all described it. It passed through the Middle Ages as a domestic remedy, was noticed, 1535, by Valerius Cordus (169), and had a place as a drug to be taxed in Germany in the 16th century. Neglected then, it was subsequently revived as a chief constituent, combined with purgatives, in a secret remedy for tape-worm, one of the promoters being Daniel Mathieu, an apothecary of Berlin. His treatment was so successful that Frederick the Great purchased the formula for an annuity of thirty pounds, and conferred on its originator the dignity of "Aulic Councillor." Madame Nouffer, the widow of a surgeon at Murten, Switzerland, was also paid 18,000 livres by

Digitized by Google

Louis XIV for a tape-worm cure, consisting chiefly of powdered fern root. J. Peschier, 1825, a pharmacist of Geneva, introduced the ethereal extract (extract by ether), which was not, however, employed to any extent in England until the middle of the last century. Its empirical record introduced male fern to the medical profession.

ASPIDOSPERMA (Quebracho)

First recognized in 1890. Dropped from *Pharmacopeia* of 1900, but reintroduced in 1910.

From time unrecorded this South American drug has been used by the natives of its habitat as a tanning material. In 1878, Schickedanz introduced it to Europe. The name Quebracho, (from *quebrar hacho*, "breaking the ax," *Am. Disp.*), is applied to several hard wood trees, but the official species from which the bark is taken is *Aspidosperma Quebracho blanco*, Schlechtendal. In 1880, Dr. August Volz (663a) made a study, accompanied by microscopic sections, of *Quebracho colorado*, in which he describes the quebracho resin, which is probably the "quebracho gum" described in 1878 by N. Pedro Arata (25a). In 1881, Mr. G. Fraude (246a) gave a process of distinguishing the true bark from its sophisticants. In 1879, Dr. Penzolt (498a) gave a report on the therapeutic uses and physiological action of quebracho, and in the same year Dr. Burgos contributed a paper on its pharmaceutical preparations. In 1882, Dr. O. Hesse (315a) made a chemical examination of the Argentine drugs, obtaining from the official species several alkaloids. In 1892, Mr. F. A. Thompson (635a), of Parke, Davis and Company, Detroit, contributed to the American Pharmaceutical Association a valuable study of many

Digitized by Google

drugs, including quebracho bark, giving the qualities of eight samples, as determined by Dr. Lyons' (395a) method of examination.

In 1899, a treatise from the pen of Frederick L. Lewton (382a) presented in detail "the different kinds of quebracho known in South America, as *Quebracho blanco, Q. colorado, Q. moreno, Q. prieto, Q. negro*, etc.," the statement being made that these were derived from "trees belonging to widely distinct genera," all hard woods, thus confirming the derivation of the name, as accepted by the *American Dispensatory*. Mr. Lewton states, furthermore, that although *Quebracho blanco* is the tree yielding the bark used in medicine, its consumption in South America is "insignificant when compared to that of *Quebracho colorado*." This latter tree "yields (382a) 25 to 28 per cent. tannin, 10 per cent. more than is yielded by the best sumach leaves." The entire trunks are ground into sawdust, and exported for making extractives used in tanning. (*Lewton*).[1]

AURANTII AMARI ET DULCIS CORTEX

(Sweet and Bitter Orange)

Orange Peel is mentioned in *all* editions of the *U. S. P.*, beginning in 1820, but not until 1860 is a division made between *Sweet* and *Bitter* Orange, excepting that we must note that the New York edition of 1830 recognizes *Bitter* Orange only. The 1860 edition also recognizes *Orange Flowers*, which are retained in the 1870 and 1880 editions, but dropped in 1890. Both Sweet and Bitter Orange Peel are official, from 1860 to the last edition, in 1910. The official species for Bitter Orange, in 1910, is *Citrus Aurantium amara, L.*, and for Sweet Orange, *Citrus Aurantium sinensis*.

Sweet and Bitter Orange. The orange, *Citrus*, was unknown to the ancient Greeks and Romans. The Arabs,

[1] Mr. Lewton is now Curator of the Medical Division of the National Museum at Washington.

Digitized by Google

(Gallesio), (255), are accepted as having introduced it into Europe, first through Africa, Arabia and Syria, from its original home in northern India. In that country a wild orange still grows, supposedly the parent of the cultivated fruit, be it sweet or bitter. The first specimen of this fruit to find its way into Europe was the bitter orange, cultivated in Rome in 1200 A. D., the sweet orange not being introduced until the 15th century, when it was imported by the Portuguese. The first oranges brought into England, seven in number, were imported by a Spanish ship, in 1290. An Arabian physician of the 12th century, Avicenna (30), employed the juice of the bitter orange in medicine.

– BALSAMUM PERUVIANUM (Balsam of Peru)

This name was first employed in the New York edition, 1830, *U. S. P.* The *substance* was mentioned in all the early editions under the name *Myroxylon*, until 1850, when the modern name was employed. Official in *all* editions of *U. S. P.*

This drug, obtained from the *Toluifera Pereiræ*, came to the attention of the earlier Spanish explorers of South America as a substance commonly employed by the natives as a remedy for wounds. It constituted a part of the tribute paid by the natives to the Indian chiefs of Cuscatlan, to whom it was presented in curiously ornamented earthen jars. This reminds us of the curious jars in which we observed mastich sold, on the island of Scio, by the collectors. These jars, holding a few ounces of the purest and clearest "tears" of mastich, have been thus, in this unique form, an article of local commerce in Scio since before the Moslem rule.

"Peruvian Balsam," on its first importation into Europe, brought enormous prices, as much as $45 an ounce being paid therefor, and in Rome, 100 ducats, or

Digitized by Google

over $200 an ounce! Pope Pius V permitted the Bishop of the Indies to substitute this Balsam of Guatemala for that of Egypt in the preparation of the chrism used in the Catholic churches. Various early descriptions of travelers refer to it more or less enthusiastically, between the conquest of Guatemala, 1524, and 1628, at which date Hernandez (314) described the tree. From the domestic use of the drug it crept into German pharmacy in the beginning of the 17th century. In consequence of the fact that the exports of Guatemala came through the port of Lima, Peru, the misleading name of "Peruvian Balsam" was in the early days affixed to it, paralleling somewhat the record of "Mocha coffee," which is not grown in Mocha, or even thereabout, but was exported therefrom in the early days of Arabian coffee.

BALSAMUM TOLUTANUM (Balsam of Tolu)

Official in all editions of the *U. S. P.*, from 1820 to 1910. Until 1850, however, its official name was *Tolutanum*, (*Toluifera balsamum*, 1820, *Myroxylon Toluiferum*, 1830 and 1840), excepting in the New York edition, 1830, in which the modern name, *Balsamum Tolutanum*, was first employed.

Balsam Tolu was found in use by the natives on the discovery of its native countries, and is today collected after the primitive manner, as is also true of "Balsam of Peru." Monardes (447) in his treatise, 1574, on West Indian productions, describes the Indian method of incising the bark and affixing shells of black wax to receive the balsam, in a district near Cartagena called Tolu, from which the material takes its name. This method of collecting the drug reminds us of that employed in Asia Minor, of collecting the juice of the Scammony plant, in the half shell of the clam. Mo-

Digitized by Google

nardes states that the drug was much esteemed by the Indians, and later by the Spaniards, who transported it to Spain. Clusius (153) received, 1581, a specimen from Morgan, an apothecary to Queen Elizabeth. The price list of the city of Frankfort, Germany, 1669, gives it a place, while in 1646 it was noticed in the records of the city of Basle. But notwithstanding that Monardes (447) figured a broken pod and leaflet, and Humboldt and Bonpland (331) saw the tree in New Granada, 1799, it was reserved for Weir, 1863, a plant collector to the Royal Horticultural Society, London, to obtain the first good specimens of the pods and leaves, Guerin, 1868, first obtaining the flowers. Thus a complete description of a drug known in domestic medicine for centuries was finally authoritatively established. The introduction of balsam of tolu into medicine and pharmacy followed the track of its empirical record, as is true of all other natural drugs of the *Pharmacopeia*.

BELLADONNÆ RADIX ET FOLIA

(Belladonna, Deadly Nightshade)

Belladonna *Leaves* have been official in *all* editions of the *Pharmacopeia*. The edition of 1860 first mentions Belladonna *Root*, but restricts it to "plants more than two years old," a restriction followed by the edition of 1870, but removed in 1880 and all editions following.

The plant *Atropa Belladonna* is native to southern Europe, extending thence to the Crimea, Caucasia and the northern parts of Asia Minor. About 1504 a book appeared in Paris titled the *Grand Herbier*, which carried the first authentic notice of belladonna, although the term "solatrum furiale," used by Saladinus of Ascoli (570), about 1450, is presumed to refer to it. The effects of belladonna, internally, were subjects of

Digitized by Google

ATROPA BELLADONNA CULTIVATION (Page 28)
Presented by Eli Lilly & Company.

Digitized by Google

Digitized by Google

treatises by Amoreaux (20a), Paris, 1760; Daries (184), Leipsic, 1776; Münch (453), Gottingen, 1783 and 1785, and subsequently by all who wrote comprehensively on medicine. In toxicology, the German botanist, Leonard Fuchs, (251) figured the plant as *Solanum somniferum*, 1542, fully identifying its poisonous properties, and J. M. Faber, Augsburg, 1677 (231a), wrote also on its poisonous action. But the people in the plant's habitat have ever been aware that all parts, even to the berries, were poisonous. So far as we can locate its record, the first study concerning its local use in the eye is that of Himly (317a) of Paris, 1802, although country people in its habitat have known from all time that it possesses the power of dilating the pupil. In physicians' practice belladonna has a more recent introduction, due to the commendation of the renowned pharmacist, Mr. Peter Squire (611), of London, who about 1860 commended belladonna tincture as the basis of a useful liniment, for the relief of neuralgic pains. The drug is now used chiefly in the making of the alkaloid atropine (now, 1921, largely obtained from *Stramonium*, which see), and in the preparation of belladonna plaster. Johnson and Johnson, New Brunswick, N. J., and Seabury and Johnson, New York City, now use an enormous amount of belladonna, yearly, in the making of plasters. Dymock is authority (*Pharmacographia Indica*, Vol. 2, p. 572) for the statement that the plant "is not mentioned by Sanskrit writers and does not appear to have been ever used medicinally in India." In America, the common name "Deadly Nightshade" is also applied to other species of Solanum. Concerning these, Professor Lewis Kundson, of the Laboratory of Plant Physiology, Cornell

Digitized by Google

University, in a private letter writes us as follows: "There are two species of Nightshade growing about Ithaca. The more common is Solanum Dulcamara, and the second is Solanum nigra. These are both of European origin, and are escaped species."

BENZOINUM (Benzoin, Gum Benjamin)

Mentioned in all editions of the *Pharmacopeia*, from 1820 to 1910. The 1910 edition names as official the gum of *Styrax Benzoin*, and "some other species of Styrax growing in the East Indies."

Benzoinum, from *Styrax Benzoin*, curiously enough, escaped the attention of the Greeks and Romans, nor, so far as is known, did those energetic tradesmen of the 10th to the 13th centuries, the Arabians and Persians, carry it to China. Ibn Batuta (333a), 1325-49, mentions "Java frankincense," which under the Arabian name became corrupted into *Banjawi*, *Benjui*, *Benzui*, *Benzoë*, *Benzoin*, and finally even to *Benjamin*. After a hundred years, the sultan of Egypt, Melech Elmaydi, sent it to the Doge of Venice among other presents, and in 1490 a second Doge of Venice was presented with a larger amount, by the same sultan of Egypt. Considered still a precious balsam, in 1476 Caterina Cornaro, queen of Cyprus, received from Egypt fifteen pounds of "Benzui." Later travelers in Siam and the Malabar Coast, Venetian tradesmen and others, gave it due consideration. During and after this time it became regularly imported into Europe. Being submitted to dry distillation in rude paper cones over a pan, the condensed distillate, or flowers, under the name of *Flores Benzoës*, in the 17th century, gave origin to the now familiar Benzoic Acid. Thus from the empiricism of the past, this grateful flavoring agent, anti-

Digitized by Google

ATROPA BELLADONNA CULTIVATION (Page 28)

Presented by Johnson & Johnson

Digitized by Google

Digitized by Google

septic, and preservative was introduced to the medicine and pharmacy of today.

BERBERIS (Berberis, Barberry)

Berberis aquifolium is mentioned in the 1900 edition only. The New York edition of 1830 names "The *berries* of *Berberis Canadensis*." The editions of 1860 and 1870 mention in their Secondary List "The bark of the root of *Berberis vulgaris*." All other editions of the *U. S. P.* ignore Berberis completely.

The berberis officially recorded in the *Pharmacopeia of the United States*, *Berberis aquifolium*, or *Mahonia*, was brought to the attention of physicians by Dr. Bundy, an Eclectic physician of California, through the manufacturing house of Parke, Davis and Company, Detroit, who established it in general professional use. (467). Mahonia had previously been used throughout the Western States as a domestic remedy in the direction commended by Dr. Bundy, and in many respects it paralleled the domestic and official uses of its near relatives in the Orient and elsewhere.

The *Pharmacopeia of India*, under the common name *Berberis*, recognizes three species of barberry, all having domestic records as tonics, dating from the earliest times, and being used in decoction or infusion in inflammatory discharges, as well as in applications for various forms of ophthalmic inflammation. The Arabian physicians employed this plant. Dioscorides (194), Pliny (514), Celsus (136), Galen (254a) and others recognized it. It was one of the Indian drugs on which the Alexandrians levied duty, 176-180 A. D. Among Greek antiquities are preserved small vases of barberry, showing its value in ancient times. Among these vases is one bearing the label of a certain Heraclides of Tarentum, who is mentioned by Celsus as

Digitized by Google

having a reputation for treating diseases of the eye. In formulas for eye diseases given by Galen (254a), barberry is authoritatively recognized. The natives of India use an extract made from various species growing in northern India, which is sold in the bazaars under the name "Rusot," and used not only in affections of the eye, but as a tonic and febrifuge. The qualities of both the official drug and its foreign relatives are similar, and were thus introduced by the common people.

BUCHU (Buchu)

Mentioned first in 1840 under the name, "*Diosma, Buchu.*" In 1850 the name *Buchu* became official, this title being still employed in the edition of 1910. Several varieties of Barosma are recognized in different editions of the *U. S. P.* as producing the official "Buchu" leaves. The 1910 edition names as official the leaves of *Barosma betulina*, (Short Buchu of commerce), and of *Barosma serratifolia* (Long Buchu).

The Hottentots of the Cape of Good Hope used the leaves of the buchu plant, *Barosma betulina*, as a domestic remedy, and from them the colonists of the Cape of Good Hope derived their information concerning it. Reece (540) and Company, London, 1821, first imported buchu and introduced it to pharmacy and the medical profession, among whom it has since enjoyed more or less favor, as well as in private formulæ and domestic practice. Perhaps no "patent" American medicine has ever enjoyed greater notoriety than, about 1860, did a weak decoction of the leaves under the term "Helmbold's Buchu", which in six-ounce bottles was sold in quantities, even car-load lots, commanding the price of one dollar per bottle. During the crusade of this preparation by Helmbold, the medical profession of America, probably inspired by press comments, prescribed buchu very freely. Buchu is still in demand,

Digitized by Google

and is still favored as a constituent of remedies recommended to the laity.

— CALAMUS (Calamus, Sweet Flag)

Mentioned in all the early *Pharmacopeias* from 1820, but given in Secondary List until 1840, when it was promoted to the Primary List, holding this place in 1850. In 1860 it was again reduced. It was official in the editions of 1880, 1890 and 1900, but was dropped entirely from the edition of 1910.

The use of calamus, *Acorus Calamus*, in the domestic medication of India, is recorded from the very earliest times. It is sold commonly in the bazaars, and Ainslie (7) in his *Materia Medica of Hindoostan*, 1813, states that in consequence of its great value in the bowel complaints of children, a severe penalty was placed on the refusal of any druggist to open his door in the night to sell calamus, when demanded. The antiquity of its use is shown from the fact that it was one of the constituents of the ointment Moses was commanded to make for use in the Tabernacle, (Ex. xxx), while the prophet Ezekiel says of the commerce of Tyre, "Bright iron, cassia, and calamus were in thy market." Theophrastus (633) mentions calamus, and Celsus (136), nearly two thousand years ago, refers to it as a drug from India. In the sixteenth century Amatus Lusitanus (16a) reports it as imported into Venice, and in 1692 Rheede (547) figures it as an Indian plant under the name *Vacha*, the same name being still applied to it on the Malabar Coast. From its tropical home calamus has spread until it is now found in all temperate climates suitable for its growth, the market supply coming mainly from Southern Russia, through Germany. The therapeutic use of calamus in pharmacy and licensed medicine, as with other like substances, is a gift of empiricism founded in the far distant past.

Digitized by Google

CALENDULA (Calendula, Marigold)

Calendula has no place in the early *Pharmacopeias*. It was official in the editions of 1880, 1890 and 1900, but was omitted altogether in 1910.

Marigold, *Calendula officinalis*, has been known, practically, from the beginning of documentary records in scientific or medicinal lines. A native of Southern Europe and the Orient, it is found under various names, from Japan to India, from the Orient to North America, to which it was carried by European colonists, according to Josselyn (345), before 1670. Dymock (*Pharmacographia Indica*, Vol. II, p. 322) states that calendula is a weed of cultivation in Northern India. In the early days of English mediæval medication it was employed in decoctions for fevers, and as a hot drink to promote perspiration. The juice was also used empirically for sore eyes, and as an application to warts. Its popular use, as heired from a time lost to history, led to its final utilization by the medical profession, and to its position in mediæval herbals, as also in many Pharmacopeias and treatises on European medicines and medication.

CALUMBA (Jateorrhiza* Calumba)

Mentioned first in 1860, calumba retains its place in all following editions. The official species of the *U. S. P.*, 1910, is *Jateorhiza palmata*.

Persons familiar with our common yellow parilla, *Menispermum canadense*, have a good idea of the plant that yields the calumba root of commerce. Indeed, a

* Derived from the Greek words *iater*, physician, and *rhiza*, root, evidently in allusion to its healing virtues. Most German and a few English authorities (*e. g.* Flückiger, the *German Pharmacopeia* of 1890, the *U. S. Pharmacopeia* of 1880, and others), spell the name "jateorrhiza," with the two r's, notwithstanding the fact that Miers, the author of the name, spelled it with a single r. In this he is followed by most authorities (except the Germans), including the *Index Kewensis* and the *U. S. Pharmacopeia* of 1890. Marmé (*Pharmacognosie*, 1886), suggests that the name *jatrorhiza* should be used instead of jateorrhiza, and so also does Koehler (Medicinal-pflanzen, 140).

Digitized by Google

casual observer would take an illustration of one for the other, so closely do they resemble each other in shape of leaf, stem, and general floral appearance. One author, Roxburgh, (559), (*Flora Ind.*, Vol. 3, p. 807), has placed the plant in the genus *Menispermum*. The genus jateorhiza as now constituted consists of three species, all natives of tropical Africa. It belongs to the natural order *menispermaceæ*. The plant which produces the colombo root of commerce is a herbaceous vine climbing over trees in the forests of eastern tropical Africa in the territory of Mozambique and Quilimani. The plants vary much in the shape of the leaves and in the amount of hispidity in the stem, and were formerly considered as belonging to two species, *Jateorhiza calumba* and *Jateorhiza palmata*, but later botanists have united them under the former name.

Calumba (also *Columbo*) root has long been in use under the name "kalumb" among the African tribes of Mozambique, (Berry), (63), who employed it as a remedy for dysentery and other diseases, and who undoubtedly brought it to the immediate knowledge of the Portuguese when they obtained possession of that country in 1508. Through the influence of traders, knowledge of the drug was slowly diffused among the Europeans during the sixteenth and seventeenth centuries.

Our first definite information regarding calumba root, however, dates from the year 1671, when Franciscus Redi, 1626-1697, (538), born at Arezzo and physician to the Duke of Toscana, describing it under the name *Calumba*, made its medicinal virtues conspicuous.

In 1695 the celebrated Leeuwenhoek (376), in his

Digitized by Google

work "*Arcana Naturæ*," recorded some chemical experiments that he had made with this root, which he calls "radix indica, rays columba." He also introduced illustrations of crystals observed in the study of this drug. Contemporaneously with this physicist, J. C. Semmedus (592) (probably in 1689 or shortly before), mentions *Calumba* in his writings as occurring among drugs originating from India. This author's work has become more prominent in a later edition (1722).

Valmont-Bomare (656c) in the 1764 edition of his dictionary describes "calumbe" as the root of an unknown tree brought to us from India. He adds that in Bengal this root is considered a specific in cases of colics, indigestion, and against the effects of "mort-du-chien," which is the old French name for colchicum.

Not, however, until in close succession appeared the treatises on calumba root by Gaubius (257a), 1771, Cartheuser (129), 1773, and Percival (499), 1773, was there much general distribution of knowledge concerning this drug. In this connection it is perhaps of interest to note that in a previous translation (dated 1755) of Cartheuser's *Materia Medica*, calumba root is not to be found.

Through Percival's recommendation especially, the drug rapidly gained entrance into European Materia Medicas, and since about 1776 we find a record of it in many of the Pharmacopeias of European countries. However, the geographical and botanical origin of calumba root as yet remained a mystery. The Portuguese, as already stated, having had a monopoly of the trade in this article, seem to have been careful not to disclose its origin, and made it a custom to carry it to India, and then to export it to Europe from Indian in-

Digitized by Google

stead of African ports. Hence for a long time the general impression prevailed that the plant was a native of India, and that the capital of Ceylon (Colombo) gave the drug its name.

From about 1770, however, the suspicion that calumba root was of African origin had been gaining ground. In this year Philibert Commerson, a French physician, collected a specimen of a certain plant growing in the garden of M. Poivre in the Isle de France, which Lamarck in 1797 named *Menispermum palmatum*, stating that this menispermum (of which he described the male plant only), perhaps yielded the root that is brought to us from India under the name of calombo or colombo root. He adds, however, that "it seems to be indigenous to India."

In 1805 a distinct advance was made in establishing its African origin. M. Fortin in this year brought the root of a male calumba plant from Mozambique to the city of Madras, where it was raised and cultivated by Dr. James Anderson. From this specimen Dr. Berry (63), in 1811, published a botanical description in the "*Asiatic Researches*," in which he also gives definite information regarding its origin and uses in its native country. The specimen was transported later by him to the Calcutta Botanical Gardens. De Candolle in 1818 named the plant *Cocculus palmatus*. However, the female plant remained still unknown.

In 1825, Captain W. F. Owen brought a male and a female plant from Oibo, in East Africa, to Mauritius, where it was cultivated and observed by Bojer. From this source, at last, Sir W. J. Hooker, (324), in 1830, was enabled to describe the whole plant, both male and female, under the name of *Cocculus palmatus*, Hooker.

Digitized by Google

The name of the genus *Jateorhiza* was finally created in 1849 by Miers. (Hooker, *Niger Flora*, p. 212). *Chasmanthera columba* is another synonym for this plant proposed by Baillon (33), (*Nat. Hist. of Plants*, Vol. III, London, 1874). This record condenses much of a study contributed by Dr. Sigmund Waldbott and the present writer, to the *Western Druggist*, Chicago, 1898.

CAMBOGIA or GAMBOGIA

(Gamboge, Pipe Gamboge)

Mentioned in *all* the *U. S. Pharmacopeias*, from 1820 to 1910. The early editions used the spelling *Gambogia*, with the exception of the New York edition of 1830, which uses *Cambogia*. Beginning with 1880, the later *Pharmacopeias* all spell the name *Cambogia*.

Gamboge is the product of a Siamese tree, *Garcinia Hanburii*, from Camboja, from whence it derives its name. Chinese travelers over a thousand years ago mentioned it, describing the method of obtaining it by an incision in the stem of the tree, whilst the Chinese herbal "*Pun tsao*" includes it in its pages. The Chinese, however, regarded the drug as poisonous, its use by them being chiefly as a pigment. Clusius (153) described in 1605 a specimen of gamboge brought from China in 1603, after which the drug drifted into European medicine as a purgative. It was one of the articles of commerce of the East India Company, and in the shops of the city of Frankfort it was recognized pharmaceutically as early as 1612. The date of the introduction of gamboge into Chinese art and medicine antedates the records of established history.

Digitized by Google

CAMPHORA (Camphor)

Recorded in all editions of the *Pharmacopeia*, 1820-1910.

Camphor (from *Cinnamomum Camphora*) has been made in China since the earliest record. Marco Polo (518), who visited that country in the thirteenth century, saw many of the trees producing it. Camphor was known to the Chinese writers of the sixth century, as well as were the qualities of the tree as a valuable timber. The earliest mention of camphor occurs in one of the most ancient poems of the Arabic language, by Imru-l-Kais, who lived in the beginning of the sixth century. That camphor was well known to Arabian writers, is shown by the following sentence from Burton's Translation of the *Arabian Nights:*

"I am kinsman to King Hassum, *Lord of the Land of Camphor;* and when his ships shall make fast to the shore."

The exaggeration of this island's camphor value is shown by the following:

"On the morrow we set out and journeyed over the mighty range of mountains, seeing many serpents in the valley, till we came to a fair great island, wherein was a garden of huge camphor trees." [1] *Sindbad the Sailor*, Vol. XI: p. 20.

That camphor was highly valued by the Arabians is shown by the following sentence, in which mention is made of it as the only material linked with ambergris:

" . . . each holding in hand a huge cierge scented with camphor and ambergris and set in a candlestick of gem-studded gold." *Alædin and the Wonderful Lamp*, Vol. XIII: p. 147.

[1] In a footnote Burton says, "Sindbad correctly describes the primitive way of extracting camphor, a drug unknown to the Greeks and Romans, introduced by the Arabs."

Digitized by Google

Notwithstanding the fact that camphor was considered by the Oriental nations as a rare and precious perfume, being mentioned in connection with musk, ambergris, and sandalwood as treasures of the Sassanian dynasty of the kings of Persia, it did not, so far as has been determined, reach Europe during the classical days of Greece and Rome. It was probably first mentioned as a European medicine by the Abbatissa Hildegarde (316), in the 12th century. Since its introduction into Europe, it has always been held in high esteem in domestic medication, and as a perfume constituent.

CANNABIS INDICA (Cannabis, Indian Hemp)

First mentioned in the *U. S. P.* in 1870, two varieties being described, named according to their origin, *Cannabis Americana* and *Cannabis Indica*. The 1880 edition continues this classification. Later editions drop the American variety, confining the drug to the Asiatic plant, until the edition of 1910, which makes no distinction between *Cannabis sativa* (American Hemp) and *Cannabis Indica*, mentioning the latter as a "variety."

Cannabis sativa, Linné, (or the variety *indica*, Lamarck), is an Oriental product whose beginnings are lost. Both Waring and Dymock state that cannabis is native to Persia and cultivated in India. Its history, as given by Dymock's *Pharmacographia Indica*, is so instructively interesting, as to lead us to give a portion, verbatim:

"The hemp plant, in Sanskrit Bhanga and Indrasana, 'Indra's hemp,' has been known in the East as a fibre plant from prehistoric times. It is mentioned along with the Vedic plant Janjida, which has magic and medicinal properties, and is described in the Athavaveda as a protector, and is supplicated to protect all animals and properties. The gods are said to have three times created this herb (oshadhi). Indra has given it a

Digitized by Google

thousand eyes, and conferred on it the property of driving away all disease and killing all monsters; it is praised as the best of remedies, and is worn as a precious talisman; along with hemp, it prevents wandering fever and the evil eye."

The name of cannabis, together with its product, *hashish* or *bhang*, threads the literature of both Arabia and India, it being continually mentioned throughout the *Arabian Nights*, for example:

"Going up to Gharib, he blew the powdered bhang into his nostrils, till he lost his senses." Burton's *Arabian Nights, History of Gharib and his Brother*, Vol. VII.

Interest in connection with Oriental names applied to cannabis and its products, leads us to record the terms cited in the *Arabian Nights*, and to attempt, (perhaps unsuccessfully), to differentiate between the drug cannabis and its products, as therein given.[1]

Bhang. Burton designates this as "The Arab *Banj* and the Hindu *Bhang*." He says, "The use of Bhang doubtless dates from the dawn of civilization, since the earliest social pleasures would be of an inebriating character." Herodotus (IV: C. 75), shows the Scythians burning the leaves and capsules in worship, and becoming drunken with the fumes. Galen also mentions intoxication by hemp. The name bhang is used most frequently in reference to the drug cannabis, but it is applied also to its products. Says Burton, (Vol. X: p. 165), "The poorer classes were compelled to puff their *Kayf* (*Bhang, Cannabis indica*) and sip their black coffee under a rainy sky." That this smoking of cannabis was very widely disseminated is shown in Vol. X:

[1] That many extravagant statements aside from thought creations are embodied in these wonderful tales all will admit. That they are based on the habits and histories of the Arabians few will deny. That in such as cannabis and other Oriental products, Burton can not be neglected, the writer of this history of drugs accepts.

Digitized by Google

p. 91, as follows: "The Bushmen and other wild tribes of Southern Africa threw their *Dakha* (Cannabis indica), on the fire and sat round it inhaling the intoxicating fumes." In the "Story of the Three Sharpers," (Vol. V: p. 19), the term *bast* appears as a *preparation of bhang:* "they would also expend two Nusfs (half a franc) upon Bast, which is Bhang." The term *flying bhang* refers to the best quality, "which flows fastest to the brain." For example, "Lastly she brought to them coffee which they drank, but hardly had it settled in their maws when the Forty Thieves fell to the ground, for she had mixed up with it *flying Bhang*, and those who had drunk thereof became like dead men." History of the Lovers of Syria, (*not* Ala Baba and the Forty Thieves). Vol. VI: p. 26.

The most artful bhang mixture was probably "*Concentrated Bhang* mixed with Opium, a drachm whereof would overthrow an elephant."

"Hardly had it settled well in his stomach when his head farwent his feet and he was as though he had been a year asleep."

Levigated bhang. This term probably refers to the smoke.

"He found King Toland asleep unattended; so he crept up and made him smell and sniff *levigated Bhang* and he became as one dead." Vol. VII: p. 31.

"Calling up a Marid by name Zu'azi'a gave him a drachm of *levigated Bhang* and said to him, 'Enter King Gharib's tent, put the Bhang up his nostrils and bring him to me.' " Vol. VII: p. 76.

Cretan bhang. This term occurs, as follows:

"Then the Caliph crowned a cup and put therein a piece of *Cretan Bhang*. . . . Hardly had it settled in his

Digitized by Google

stomach when his head forewent his heels and he fell to the ground."

Bhang Antidotes. In a footnote Burton says, "As has been seen, acids have ever been and are still administered as counter inebrants, while hot spices and sweets greatly increase the effect of Bhang, Opium, Henbane, Datura, etc." This is illustrated as follows:

"So he made him smell vinegar and frankincense." Vol. XI: p. 9.

"So they made him sniff vinegar, and he came to himself." Vol. XI: p. 5.

Hashish. This term is used with many meanings, but it seems by Burton to be applied (but not restricted) to a form of cannabis taken or used voluntarily, as for example, "Another man, a *Hashish-eater.*" Possibly no better formula for the making of Hashish or description of its effects can be found, than that given on the several pages of the "Tale of the Kazi and the Bhang Eater," (Vol. XV: pp. 194-241). From this we extract a few sentences that apply:

"Furthermore I conceive that the twain are eaters of Hashish, which drug when swallowed by man, garreth (maketh) him prattle of whatso he pleaseth and choseth, making him now a Sultan, then a Wazir, and then a merchant, the while it seemeth to him that the world is in the hollow of his hand."

"Quoth the Sultan, 'And what may be thy description of Hashish?' Replied the Wazir.

(*Hashish Formula*) " 'Tis composed of hemp leaflets whereto are added aromatic roots and somewhat of sugar; then they cook it and prepare a kind of confection which they eat, but who so eateth it, (especially

Digitized by Google

if he eat more than enough), talketh of matters which reason may on no wise represent."

Kayf. The sensation is delightful. Sonnini says: "The Arabs give the name Kayf to the voluptuous relaxation, the delicious stupor produced by smoking of hemp." Burton says, "I have smoked it and eaten it for months without other effect than a greatly increased appetite and a little drowsiness." Footnote, Vol. XV. p. 196.

Ganjah or *Gunjah.* This term, prominent in East Indian lore, is not found in Burton's Arabian translations, but it appears frequently in Dymock's *Pharmacographia Indica,* from which we extract as follows, pp. 320-322:

"The intoxicating properties which the plant possesses in its Eastern home appear not to have been discovered until a more recent date, but in the fifth chapter of Menu, Brahmins are prohibited from using it, and in the sacred books of the Parsis the use of *Bana* for the purpose of procuring abortion is forbidden. In Hindu mythology the hemp plant is said to have sprung from the *amrita* produced whilst the gods were churning the ocean with Mount Mandara. It is called in Sanskrit Vijaya, 'giving success,' and the favorite drink of Indra is said to be prepared from it. On festive occasions, in most parts of India, large quantities are consumed by almost all classes of Hindus. The Brahmins sell Sherbet prepared with *Bhang* at the temples, and religious mendicants collect together and smoke *Ganja.* Shops for the sale of preparations of hemp are to be found in every town, and are much resorted to by the idle and vicious. Hemp is also used medicinally; in the *Raja Nirghanta* its synonyms are names which mean

Digitized by Google

'promoter of success,' 'the cause of a reeling gait,' 'the laughter moving,' etc.

"The seductive influences of hemp have led to the most extravagant praise of the drug in the popular languages of India, but in truth it is one of the curses of the country; if its use is persisted in, it leads to indigestion, wasting of the body, cough, melancholy, impotence and dropsy. After a time its votary becomes an outcast from society, and his career terminates in crime, insanity and idiocy.

" 'Who *ganja* smoke do knowledge lack, the heart burns constantly,
The breath with coughing goes, the face as monkey's pale you see.' —*Fallon.*

"According to tradition, the use of hemp as an intoxicant was first made known in Persia by Birarslan, an Indian pilgrim, in the reign of Khusru the First (A. D. 531–579), but as we have already stated, its injurious properties appear to have been known long before that date.

"There can be no doubt that the use of hemp as an intoxicant was encouraged by the Ismailians in the 8th century, as its effects tended to assist their followers in realizing the tenets of the sect:

" 'We've quaffed the emerald cup, the mystery we know,
Who'd dream so weak a plant such mighty power could show!'

"Hasan Sabah, their celebrated chief, in the 11th century, notoriously made use of it to urge them on to the commission of deeds of daring and violence so that they became known as the Hashshashin or 'Assassins.' Hasan studied the tenets of his sect in retirement at Nishapur, doubtless at the monastery noticed by

Digitized by Google

O'Shaughnessy (*Bengal Dispensatory*), in the following terms: 'Haidar lived in rigid privation on a mountain between Nishapur and Rama, where he established a monastery; after having lived ten years in this retreat, he one day returned from a stroll in the neighborhood with an air of joy and gaiety; on being questioned, he stated that, struck by the appearance of a plant, he had gathered and eaten its leaves. He then led his companions to the spot, and all ate and were similarly excited. A tincture of the hemp leaf in wine or spirit seems to have been the favorite formula in which Sheikh Haidar indulged himself. An Arab poet sings of Haidar's emerald cup, an evident allusion to the rich green color of the tincture. The Sheik survived the discovery ten years, and subsisted chiefly on this herb, and on his death his disciples at his desire planted it in an arbor round his tomb. From this saintly sepulchre the knowledge of the effects of hemp is stated to have spread into Khorasan. In Chaldea it was unknown until 728 A. D., the kings of Ormus and Bahrein then introduced it into Chaldea, Syria, Egypt and Turkey.

"'The Greeks were acquainted with hemp more than 2000 years ago; Herodotus mentions it as being cultivated by the Scythians, who used its fibre for making their garments, and the seeds to medicate vapour baths.'"

Imported into Europe preceding 1690, cannabis passed into disuse until Napoleon's expedition to Egypt (1809–10), when it was again revived by De Sacy and Bouger. Waring's *Pharmacopeia of India* states that the "fullest account of the history and physiological effects of Indian Hemp is furnished by Sir W. O'Shaughnessy's *Bengal Dispensatory*, pp. 579–604.

Digitized by Google

Its introduction into European medicine (1838–39), followed the experiments of O'Shaughnessy (484) in Calcutta, and since that time cannabis and its resin have received a place in most Pharmacopeias. From the beginning of East Indian history, hemp has been smoked as a narcotic intoxicant, and when surreptitiously added to sweetmeats and foods, it has, in Oriental life, been employed as a narcotic with the utmost recklessness. This is shown in the exaggerations of the *Arabian Nights*, which portrays so many life habits of those times. The writer of these studies (1906) found hashish of several qualities both in the bazaars of Asia Minor and Constantinople, one specimen "extra fine hashish" costing him, in a Constantinople bazaar, over two dollars (gold) an ounce.

CANTHARIS (CANTHARIDES) (Spanish Flies)

Official in all editions of *U. S. Pharmacopeia*, from 1820 to 1910.

Spanish Flies (*Cantharis vesicatoria*). This once popular remedial agent has lost its position in modern medication. Its use came hand in hand with medical cruelty, and was an heirloom of ancient heroic medication. Hippocrates (B. C. 375–400) valued cantharides in dropsy and also in amenorrhea, and it goes without question that a substance so heroic in its action would once have been popular in both domestic and professional American medication. Its use in erysipelas and as a plaster, and to "draw the nervous energy and the circulating fluid" to the surface, and "thus again relieve irritation and inflammation of internal parts," are relics of comparatively recent American medical literature, writers in good reputation commending it highly. At present, however, cantharis is in such dis-

Digitized by Google

favor as to make it a novelty for a cantharis plaster to be prescribed by a modern physician. The change from extreme popularity to practical disuse has come within the experience of this writer.

CAPSICUM (Cayenne Pepper)

Official in all editions of the *Pharmacopeia*, from 1820 to 1910.

This drug, *Capsicum frutescens*, is of American origin, its home being in the West Indies, Mexico, and other tropical countries of America, where, at the time of the discovery of America, it was used by every one as a desirable pepper in preparing food. In domestic American medicine, capsicum has ever been an important remedy, and was a very prominent drug in the Thomsonian school (638) of American medicine. Capsicum was the principal ingredient of the famous "Number 6" of Samuel Thomson, and thence was made official in the *U. S. Pharmacopeia* as Compound Tincture of Capsicum and Myrrh. It is now a member of most materia medicas throughout the world. By far the largest amount of capsicum is, however, consumed in culinary directions.

CARDAMOMUM (Cardamom)

Official in all the *Pharmacopeias*, from 1820 to 1910.

Cardamomum, (*Elettaria Cardamomum*), has been used from a remote period, being mentioned in the writings of Susruta (622). It appears in the list of Indian spices liable to duty in Alexandria, A. D. 176–180. The Portuguese navigator Barbosa (39) first definitely describes its origin as a product of the Malabar Coast. Since its introduction from the Orient, cardamom has been used, as it has been in its home

Digitized by Google

from all time, as a flavor and a stomachic. Several forms of cardamom are found in the bazaars of Turkey and Arabia, where it is brought by means of caravans. It is largely cultivated at the present time as an article of commerce. This writer found (1906) "large" cardamom seeds strung on strings and sold by count in bazaars in Smyrna and elsewhere in Asia Minor.

CARUM (Caraway, Caraway Seed)

Official in all editions of the *Pharmacopeia*, from 1820 to 1910.

Although the home of caraway (*Carum Carvi*) appears to have been in the northern and midland parts of Europe and Asia, it was known to the Arabians, and at an early date was introduced into England. In German domestic medicine of the twelfth and thirteenth centuries the word *cumich* occurs, which is still the popular name for caraway in Southern Germany. At the close of the fourteenth century caraway was much used in England, where it was largely employed in cooking. It was not used in India in either cooking or medicine, nor does it appear in the record of the early days to have been included among Indian spices. It has a domestic reach that dominates its use everywhere.

The admirable history of caraway, in the *Pharmacographia* of Flückiger and Hanbury, is so complete and yet so condensed as to lead us to introduce it, verbatim, as follows (240):

"History.—The opinion that this plant is the *Karos* of Dioscorides, and that, as Pliny states, it derived its name from Caria, (where it has never been met with in modern times), has very reasonably been doubted.

"Caraway fruits were known to the Arabians, who called them *Karawya*, a name they still bear in the

Digitized by Google

East, and the original of our words *caraway* and *carui*, as well as of the Spanish *alcarahueya*. In the description of Morocco by Edrisi, 12th century, it is stated that the inhabitants of Sidjilmasa (in the southeastern province), cultivate cotton, *cumin*, *Caraway*, henna (*Lawsonia alba*, Lamarck). In the 13th century, caraway is compared to cumin and anise. The spice probably came into use about this period. It is not noticed by St. Isidore, archbishop of Seville in the 7th century, though he mentions fennel, dill, coriander, anise, and parsley; nor is it named by St. Hildegard in Germany in the 12th century. Neither have we found any reference to it in the Anglo-Saxon *Herbarium of Apuleius*, written *circa* A. D. 1050, or in other works of the same period, though cumin, anise, fennel and dill are all mentioned.

"On the other hand, in two German medicine-books of the 12th and 13th centuries, there occurs the word *Cumich*, which is still the popular name of caraway in Southern Germany; and *Cumin* is also mentioned. In the same period the seeds appear to have been used by the Welsh physicians of Myddvai. Caraway was certainly in use in England at the close of the 14th century, as it figures with coriander, pepper and garlick in the *Form of Cury*, a roll of ancient English cookery compiled by the master-cooks of Richard II about A. D. 1390.

"The oriental names of caraway show that as a spice it is not a production of the East:—thus we find it termed *Roman* (i. e. *European*), *Armenian*, *mountain*, or *foreign Cumin; Persian* or *Andalusian Caraway;* or *foreign Anise*. And though it is now sold in the Indian bazaars, its name does not occur in the earlier lists of Indian spices."

Digitized by Google

CARYOPHYLLUS (Clove)

Official in all editions of the *U. S. P.*, from 1820 to 1910.

Indigenous to the Molucca Islands proper, cloves (*Eugenia aromatica*) have been an article of Indian commerce since an early date. Known to the Chinese writers of the Han dynasty, 266 B. C. to 220 A. D., cloves became known to Europe about the fourth century, after which they became increasingly an article of commerce, although, for a long time, they were very expensive. The original home of the clove, the Moluccas or Clove Islands, now produces no cloves at all. Dymock, (*Pharmacographia Indica*, Vol. II, p. 20), records as follows:

"It is difficult to say when cloves were first introduced into India, but they are mentioned by Charaka, who is considered to be the oldest Sanskrit medical writer, under the name of *Lavanga*, a name which, with various modifications, is applied to cloves all over India. They are regarded by Sanskrit writers as light, cooling, stomachic, digestive and useful in thirst, vomiting, flatulence, colic, etc., and are prescribed with other spices and with rock salt. (Dutt's *Hindu Materia Medica.*) A paste of cloves is applied to the forehead and nose as a remedy for colds. A clove roasted in the flame of a lamp and held in the mouth is a popular remedy for sore throat. The early Arabian writers call them Karanfal, a name evidently derived from the Indian language of the Malabar Coast, Ceylon, and the Straits."

The aromatic nature of cloves made of them a great favorite, and they were therefore used to perfume the breath and to flavor food, as well as being employed in domestic medicines, such as stomachic cordials. The

Digitized by Google

well-known Blackberry Cordial of Kentucky is largely spiced with cloves and cinnamon, its blackberry part being the juice of the ripe berries, its alcoholic part, whisky.

CASSIA FISTULA (Purging Cassia)

Dropped from the 1910 *Pharmacopeia*. Not mentioned in the New York edition of the 1830 *U. S. P.* Official in all other editions.

Galen (254a) mentions a cheap cassia called *fistula*, but seemingly he refers not to this drug, but to a coarse cinnamon, rolled up as a tube. The fruit now known as *Cassia Fistula* was noticed by Joannes Actuarius (4), of Constantinople, who minutely describes it, during the 13th century. Cassia is also mentioned by writers of the school of Salernum. It was a familiar domestic remedy in England at the time of Turner (656), 1568, and as it is cathartic, it naturally appealed to heroic medicationists. Although carried in the *Pharmacopeia*, it has never been much used in American medicine.

CHIMAPHILA (Chimaphila, Pipsissewa)

Mentioned first in the 1830 *Pharmacopeia* (Philadelphia). Not mentioned in the 1830 edition, New York. Dropped from the 1910 edition. Official in all other editions of the *U. S. P.*

Pipsissewa, *Chimaphila umbellata*, is a creeping, evergreen vine native to northern latitudes of Europe and Asia. It is found also in the United States in shady woods, where it prefers loose, sandy soil. The Indians of North America considered chimaphila of importance, and used decoctions of it in nephritis, scrofulous and rheumatic disorders. Mitchell (441), in his *Inaugural Address*, 1803, University of Pennsylvania, gave chimaphila particular attention, whilst in domestic medicine it was in favor as a tea, in the sections of country where

Digitized by Google

it was native, its use being especially in the direction of rheumatic and nephritic affections.

CHIRATA (Chirata)

First mentioned in *U. S. P.* in 1860. The name here, and in 1870, is spelled *Chiretta*. Official in 1880, 1890 (as *Swertia Chirayita*) and 1900. Dropped in 1910.

An annual herb of the mountainous regions of Northern India, chirata (*Swertia Chirayita*) has long been held in esteem by the Hindoos, being frequently mentioned by Susruta (622). It did not attract attention in England until 1829, and was introduced into the *Edinburgh Pharmacopeia* in 1839. It was first described by Roxburgh (559) in 1814. No record of its introduction into Indian medicine nor to its original usage is possible, other than that it is a gift of native medication and is described in Sanskrit writings.

CHONDRUS (Irish Moss)

First mentioned (in Secondary List) in 1840. Transferred to Primary List in 1850. Official in all subsequent editions, including 1910, in which two species are named as official, *Chondrus crispus* and *Gigartina mamillosa*.

Irish moss, *Chondrus crispus*, has been known from an early period, its use being chiefly as a domestic medicine. Neither the *London* nor the *British Pharmacopeia* ever gave it a position. Todhunter at Dublin, 1831, introduced it to the notice of the medical profession. The method of its employment is yet in decoction or infusion, no attempt being made to improve upon the method employed in its domestic use.

Digitized by Google

CHRYSAROBINUM (Chrysarobin)

Mentioned first in 1880. Official in all editions following. The *U. S. P.* of 1910 mentions "a substance deposited in the wood of *Vouacapoua Araroba*" as the official source of Chrysarobin.

This substance, formerly supposed to be identical with crude chrysophanic acid, is derived from *Goa Powder*, a deposit found in the cavities of the trunk of the *Andira Araroba*, a South American tree. It is used in skin diseases in the same manner as the crude Goa powder, from which it is simply a mechanically separated material. Goa powder was employed in native medication as a remedy in skin diseases, which brought it to the attention of physicians, and led to its introduction into medicine, as well as to its final insertion in the *Pharmacopeia*.

CIMICIFUGA (MACROTYS)

(Black Snakeroot, "Black Cohosh")

While named in every edition of the *U. S. P.*, it was, in the early editions, found in the Secondary List only. In the edition of 1840 it was promoted to the Primary List, and since that date it has been wholly official. According to the edition, its nomenclature varies. In 1820 and 1828, the name *Cimicifuga Serpentaria* is official. In the Philadelphia edition of 1830, *C. Serpentaria* and *C. racemosa* are named, while the New York edition of 1830 makes official *C. Serpentaria* and *Actæa racemosa*. The 1840 and all succeeding editions, including that of 1910, recognize *C. racemosa* alone, but base their authority upon different botanists, the editions of 1840, 1850 and 1860 naming Torrey and Gray, those of 1870 and 1880 Elliott, while all later editions name (Linné) Nuttall.

Cimicifuga, (*Macrotys*), is abundantly distributed in rich woodlands over the greater portion of the United States east of the Mississippi River, except in New England and the extreme South. It is also found in Missouri and Arkansas. Because of the color of the root and its reputed use in snake-bite,

Digitized by Google

it was commonly known to the early settlers as *black snakeroot*. Other names commonly applied to it were "*black cohosh*," [1] rattle weed, rattle root and rattle snakeroot, so named because the dried spikes carrying the seed rattle in the wind. These last terms are sometimes corrupted into rattlesnake root and blacksnake root. Because of its employment in female ailments by the Indians, the name "squawroot" was also given this plant, but this term was more extensively employed with reference to *Caulophyllum thalictroides*, or blue "cohosh," the majority of writers giving the preference to that drug. The name cimicifuga suggested the common names "bugwort" and "bugbane," but while these were applicable to the various European species, that were used to drive away insects, they were, so far as we know, misapplied in the direction of the American species. Still another common name was richweed, given by Gronovius, 1752, because the plant frequents rich woodlands. But the name "richweed" is now given by botanists to *Pilea pumila*, a very different plant.

Macrotys was observed by the earliest European travelers in America, being first described by Plukenet in 1705. That writer, who lived when new plants were pouring into England from this country, and whose publications were rich in descriptions of American plants, classed cimicifuga with the *Actæa spicata* of Europe, using the old generic name "*Christophoriana Canadensis racemosa.*" His inaccurate, but yet sufficient, drawing establishes the plant's identity. His specimen is preserved in his herbarium in the British

[1] The name "cohosh," an Indian term of uncertain meaning, was given to four widely different American plants, namely, macrotys or "*black cohosh*," Actæa alba or "*white cohosh*," Actæa spicata or "*red cohosh*," and Caulophyllum thalictroides, or "*blue cohosh*."

Digitized by Google

Museum. Following Plukenet, other pre-Linnæan writers classed the plant with *Actæa*, mostly under Tournefort's name, Christophoriana. Linnæus gave it the name *Actæa racemosa*, under which it was classed until Pursh referred it to the genus *Cimicifuga*. Rafinesque, 1808, by reason of the fact that the fruit does not accord with that of either actæa or cimicifuga, proposed the name *Macrotrys actæoides*, changing the name in 1828 to *Botrophis Serpentaria*. Eaton, in the fourth edition of his *Manual*, followed Rafinesque, but perpetuating the error of De Candolle, who preceded Eaton, he incorrectly spelled the name, calling the plant *Macrotys Serpentaria*, the latter being Pursh's specific name. The following botanical history by C. G. Lloyd, from *Drugs and Medicines of North America*, is of such interest as to lead to its reproduction, verbatim:

"Cimicifuga is a very conspicuous and showy plant when in bloom, and hence was noticed by the earliest travelers in America and carried to the botanical gardens of Europe early in the 18th century. It was first described by Plukenet, and rudely figured in his *Amaltheum Botanicum*, 1705. Several other pre-Linnæan writers mentioned the plant, all classing it with *Actæa*, mostly under Tournefort's name, Christophoriana, and designating it with specific adjectives indicating its long raceme or spikes.

"When Linnæus first specifically named plants in his *Species Plantarum*, 1753, in common with previous writers, he included this plant with Actæa, to which it is very closely allied in habit, appearance, properties, powers, etc., and called it *Actæa racemosa*.

"At that time, but two of the species now constituting the genus *Cimicifuga* were known, the plant under con-

Digitized by Google

sideration, and *C. fetida* of Eastern Europe. Had Linnæus made a genus for these two, he would have had a genus containing two plants belonging to entirely different orders of his artificial system. He did, in after years, separate the European species from Actæa under the generic name Cimicifuga, but he did not include our plant in that genus.

"The Linnæan name, *Actæa racemosa*, was retained till the beginning of the 19th century by all writers excepting Walter, who called the plant *Actæa monogyna*.

"It was Pursh who first referred it to the genus Cimicifuga which Linnæus had established for the European plant. Michaux had previously referred to this genus our mountainous species (*Cimicifuga americana*), which he discovered. Pursh, in addition to this species, having seen our northwestern species, (*Cimicifuga alata*, that he considered identical with the European species, *Cimicifuga fetida*), noticed the great similarity of the three plants, and placed them all in a common genus. The plant under consideration he called *Cimicifuga Serpentaria*.

"Four years later, Nuttall, in enumerating the then known plants of the United States, restored the old specific name, calling it *Cimicifuga racemosa*. In the same year, but after the publication of Nuttall's work, (as is evident from his mentioning that work), Barton used the same name, evidently taken from Nuttall's work, but without giving him credit for it. Hence De Candolle and several other writers have incorrectly referred the authorship to Barton. It is remarkable, however, that in all the works of both Torrey and Gray, and in most recent works on American botany, the authorship of the name has been credited to a botanist

Digitized by Google

(Elliott) who did not use the name until six years after it was published by both Nuttall and Barton, and that this same error should have been made in the last very carefully prepared edition of the *United States Pharmacopeia*, of 1880.

"The following are the distinctive characters between the two genera, Actæa and Cimicifuga, as established by Linnæus. They are drawn entirely from the fruit, as there is no other point of distinction.

Actæa	*Cimicifuga*
Fruit, a solitary, fleshy berry.	Fruit, five or four dry follicles.

"It will be seen that Cimicifuga racemosa does not accord with either genus as defined by Linnæus, as the fruit is a dry follicle, but solitary. On this account Rafinesque proposed to establish for it a new genus, Macrotrys, (from *makros*, large, and *botrus*, a bunch, referring to the large raceme of fruit. *Eaton*), calling the plant *Macrotrys actæoides*. (*Medical Repository*, 1808.)

"There is really some structural ground for Rafinesque's genus, because the plant differs from all others of the genus Cimicifuga, as follows; but there is, however, such close relationship in every other particular that this difference can not be considered sufficient for maintaining the plant in a separate genus:

Cimicifuga racemosa Macrotrys Raf.	*All Other Species of Cimicifuga*
Follicle abrupt at the base, solitary, ovoid, seeds smooth, numerous, compressed horizontally.	Follicles five (or four) flattened, stipitate, seed rough with slender projections.

"In 1828 Rafinesque changed his generic name to *Botrophis*, calling the plant *Botrophis Serpentaria*. He

Digitized by Google

gives his reasons for the change as follows: 'The name Macrotrys is delusive and harsh. I have found a better one, meaning snake raceme, (from *botrus* a bunch, and *ophis* a snake), the raceme or long spike of flowers being mostly crooked and like a snake.'

"But one other American botanist has ever followed Rafinesque's generic views. Eaton, in the fourth edition of his *Manual* adopted them, but used Pursh's specific name, calling the plant *Macrotys Serpentaria*. In subsequent editions he used the old specific name, and called it *Macrotys racemosa*.

"Eaton was very positive regarding the rights of the plant to generic rank. He spelled the name, however, incorrectly—*Macrotys* instead of *Macrotrys*, an error that was made by De Candolle, from whom no doubt Eaton took it.

"About the time that black cohosh was beginning to be used by the Eclectic practitioners, Eaton's *Manual* was the popular text book of botany. Hence it is that his name, *Macrotys racemosa*, was given to the plant in the early medical works, and has persistently clung to it in spite of botanical authority, even to the present day.

"*Forms.—Cimicifuga racemosa* has but little tendency towards variation. Specimens from a number of widely distant stations show a constancy of character.

"In central Pennsylvania, there exist two plants distinguished by root gatherers as the tall and the small snakeroots. We are indebted to Kate F. Kurtz for specimens of the tops and rhizomes of both plants. A close examination, however, shows no difference except in development. The fresh rhizome of the tall plant is much larger and darker colored, and the roots coarser. We can only consider this plant a robust form."

Digitized by Google

The name *Macrotys* is now so firmly established in Eclectic literature that it is not likely to be displaced, although in botanical works as well as in the *Pharmacopeia* the plant has become generally known as *Cimicifuga racemosa.*

Cimicifuga, (Macrotys), was highly valued by the Indians, who employed decoctions of the root for diseases of women, for debility, to promote perspiration, as a gargle for sore throat, and especially for treatment of rheumatism. These uses by the Indians introduced the drug to students of early "domestic" American medicine, and it was consequently given much attention by such early writers as Schöpf, 1785, Barton, 1801, Peter Smith, 1812, Bigelow, 1822, Garden, 1823, Ewell, 1827, Rafinesque, 1828, and Tonga and Durand's addition to Edwards' and Vavasseur's *Materia Medica*, 1829. None of the early writers added anything not already given by the Indians, so far as the field of action of the drug is concerned, excepting perhaps a statement by Howard, (Botanic), 1832, who was an enthusiast in favor of macrotys in the treatment of smallpox, a claim supported forty years after by Dr. G. H. Norris. In a paper read before the Alabama State Medical Association, 1872, he reported that during an epidemic of smallpox in Huntsville, Alabama, families using macrotys as a tea were absolutely free from smallpox, and that in these families vaccination had no effect whatever so long as the use of macrotys was continued. [1]

In the early use of the drug, the infusion was employed, the following being Howard's statement (1836) concerning it:

[1] This is of great interest and should be systematically verified.

Digitized by Google

"Infuse a handful of the roots in a quart of boiling water, and take in doses of a common-sized teacup full, three or four times a day. We are constrained, however, to notice one circumstance connected with this subject; that the effect produced upon the system by a large dose of the tincture of the rattle-root, (which is sometimes used instead of the tea), in some instances is very alarming, though we have heard of no case in which any bad consequences have followed its use."

It is interesting to note that Howard calls attention to the fact that the effect of the infusion is not marked by the alarming action of a large dose of the drug, as is the case with the tincture. The reason is evidently because the watery menstruum does not carry the energetic resinous compounds that are present in such large quantities in the alcoholic liquid. This indicates the watchful care of the early investigators of botanic drugs, and perhaps the error of the alcoholic substitutors.[1]

Following the writers above mentioned came the Eclectic fathers, as well as the founders of the Pharmacopeia, and of the *United States Dispensatory*, all of whom gave to "Macrotys" its full value. Among these may be mentioned Beach, Dunglison, Wood, Griffith, Lee and King, to the last of whom (an ardent believer in macrotys) is unquestionably due the conspicuous position the drug has attained in Eclectic literature, as well, probably, as a large share of its popularity in other directions. Professor Dunglison, 1843, placed macrotys with the special sedatives, stating that "it unites with a tonic power, the property of stimulating secretions,

[1] In the opinion of the writer of these notes a pharmaceutical blunder has been made in the lavish use of alcohol in plant pharmacy.

Digitized by Google

particularly those of the skin, kidneys, and pulmonary mucous membrane." He records its value in rheumatism, and italicizes the statement that "the more acute the disease, the more prompt and decided will be the action of the remedy."

The Committee of the American Medical Association, 1848, Dr. N. S. Davis, Chairman, reported that the committee "uniformly found Macrotys to lessen the frequency and force of the pulse, to soothe pain and allay irritability." In a word, they held it to be "the most purely sedative agent we possess, producing its impression chiefly on the nervous system of organic life." (See *Drugs and Medicines of North America*). (389).

CINCHONA[1] (Cinchona, Peruvian Bark)

Official in every edition of the *U. S. P.*, from 1820, following. The species of cinchona official in 1910 are those derived from *Cinchona Ledgeriana, Cinchona Calisaya*, and of hybrids of these with other species of cinchona. Red cinchona is derived from *Cinchona succirubra*, or of its hybrids.

The *Extra Pharmacopeia*, Martindale and Westcott, Vol. I, 1920, describes the bark as follows: "The principal dried barks used for the production of the salts of the cinchona alkaloids are: red cinchona bark, from *Cinchona succirubra;* yellow cinchona bark, obtained from *Cinchona Calisaya* containing upwards of 6% of alkaloids (half of which is quinine); pale cinchona bark (crown or Loxa bark), from *Cinchona officinalis* (containing 5% alkaloids, of which 3½% may be quinine); the bark of *Cinchona lancifolia*, Mutis; Colombian bark (containing about 2% alkaloids, of which only small proportion is quinine); and other species of cinchona; that of certain species of Remijia may also be used. The variety most used for making galenical preparations is the cultivated red cinchona."

Possibly never before, surely never since, has a remedial agent of the vegetable world met vicissitudes

[1] Descriptions of the trees yielding cinchona bark, together with the processes of the natives in its collection, are most interesting. But to include in this article a section devoted thereto is impracticable. The publications cited as authorities cover the ground to the fullest extent.

Digitized by Google

such as were experienced by cinchona during the half-century following its discovery in the Peruvian wilds. To make a creditable summary thereof is a very difficult task. To condense into a short article merely the principal events of its voluminous record, with full references to publications regarding this South American bark, can not here be accomplished.

The mystery shrouding the discovery of cinchona has never been authoritatively cleared. In the light of its present supremacy and world-renowned importance, the discredit and odium cast upon it in the early records, when its only friends were laymen, charlatans and semi-professional empiricists, seem now almost incomprehensible. Past literature of more than half a century voices acridly the distractions bred in the ranks of the medical profession, as this strange bark, a gift of the mountain fastnesses of the Peruvian tropics, forced itself into prominence. The monstrous reports concerning its harmfulness, and the divisions in the profession itself as regards its usefulness, bespeak toleration today, as physicians and pharmacists now differ concerning fact, ideals, and ethics with other drugs.

INDIAN HISTORY: That the natives of Peru were not aware of the value of cinchona in fevers, is the opinion of many writers, including Humboldt, the explorer, and Ulloa.[1] Humboldt (see *Pharmacographia*) states as follows: "At Loxa the natives would rather die than have recourse to what they consider

[1] A celebrated mathematician and naval officer, born at Seville in Spain, 1716. He accompanied La Condamine, Gordin and other "Savants" in the historic expedition to South America to measure a degree of meridian of the equator, 1735. He gave particular attention to the cinchona subject, protesting to the Spanish government against the habit of destroying the trees to get the bark, advising that others be planted in their stead. "Though the trees are numerous, yet they have an end."

Digitized by Google

so dangerous a remedy." To this Flückiger[1] adds, "The early native history of cinchona is lost in obscurity, but traditions are not wanting." Markham, page 5, says, "It is mentioned neither by Inca Carcilasso de la Vega,[2] nor Acosta,[3] in their lists of Indian medicines." To this Markham adds, "It seems probable, nevertheless, that the Indians in the neighborhood of Loxa, 230 miles south of Quito, where its use was first made known to Europeans, were aware of the virtues of Peruvian bark, and the local name for the tree, *quina-quina*, 'bark of barks', indicates that it was believed to possess some special medicinal properties."

Other writers, on evidence equally valid, assert that the bark of cinchona was undoubtedly employed in native Indian medication. An argument in favor of their view, and an explanation for the secrecy maintained by the natives, is that the cruel methods of the Spanish conquerors led the Indians to guard from the invaders all knowledge of this, their greatest treasure.

[1] When reference is made to Flückiger personally, his illustrated, 101-page work, *The Cinchona Bark*, translation by Frederick B. Power, Ph.D., is intended. His contributions to Pharmacographia are embraced under the title of the book.

Frederick August Flückiger was born in Langenthal, Schuyts, Switzerland, May 15, 1828. One of the world's foremost pharmacologists and teachers, he held the esteem of all who knew him either personally or through his contributions to science. To cite his publications is impossible in this note. His crowning efforts may be seen in *The Cinchona Barks* and *Pharmacographie*. The writer of this note may be excused, he hopes, for stating that he treasures a letter from Dr. Flückiger, 1885, stating that he was using the article on aconite in his teaching, as well as other chapters of *Drugs and Medicines of North America*. Nor less to be prized is the honor of having been selected by Dr. Flückiger to unite with him in the production of a Pharmacographia of North American Medicinal Plants, interrupted by the death of Dr. Flückiger.

[2] Garcilaso de la Vega. He was surnamed The Inca by reason of the fact that he was born in Peru, his mother being a native Princess descendant of the Incas. He published a History of Peru and obtained a pension from Philip II. 1605 he wrote an account of the conquest of Florida by De Soto. See Prescott's *History of Conquest of Peru*, Vol. I, book II.

[3] Acosta, Joseph, Spanish Jesuit born in Medina Del Campo, about 1530. In 1571 became missionary to South America. On his return in 1588, he published *Natural and Moral History of the Indes*. Connecting himself afterwards with the University of Salamanca, and died in 1600.

Digitized by Google

Jussieu[1] states that the first knowledge of the efficacy of this bark was derived from the Indians of Malacotas, some leagues south of Loxa. Weddell's History.[2]

Ralph Irving,[3] 1785, records current tradition of his day, as follows: "It has been generally supposed that the Indians were acquainted with the use of this bark as early as the year 1500. It has also been alleged that the discovery was due to the accident of a diseased Indian drinking from necessity some stagnant water wherein this tree had long macerated." This traditional narrative is varied by others, who state that "the party cured was a Spanish soldier." (Wellcome, page 829.) Irving, in answer to the question why for more than one hundred years no mention was made of this drug in early Spanish literature, says, page 125, "Such discoveries were indeed poor objects for a rapacious and illiterate army, whose every path was marked with cruelty and slaughter." Joseph de Jussieu, who visited Loxa in 1739, reports that the bark was "first made known to a Jesuit missionary cured of a fever by an Indian priest of the Sun Worshippers," Flückiger. Perhaps the latest evidence on this phase of the cinchona subject is that contributed by Henry

[1] Brother of Antoine and Bernard de Jussieu: a famous family of scientists. Joseph, in 1735, visited Peru as Botanist, collecting specimens and general information, under an exploring expedition of the French and Spanish governments. In 1739 he visited Loxa in association with La Condamine in the first examination of the Loxa cinchona trees, remaining in South America after La Condamine's departure. In all he spent thirty-four years in laborious, self-sacrificing pioneering research, to be at last robbed by a dishonest servant of his great collection of plants and specimens. In 1771 he returned to France, deprived of reason by the great loss.

[2] Dr. H. A. Weddell is accepted as exceptional authority on the cinchona subject. In his voyage to Bolivia and Peru he made special studies of the cinchonas, published many treatises on this history and connected problems, the one issued in Paris (1849) being illustrated by 34 plates. His name occurs in all historical reviews of Peruvian bark.

[3] Ralph Irving dedicated his 101-page dissertation to John Eliott, Esq., December 16, 1784. It comprised experiments and statistics on "Red and Quill" Peruvian Bark, the Dissertation being awarded first prize by the Harveian Society of Edinburg, 1784. The book was published in 1785.

Digitized by Google

S. Wellcome[1], who in 1878-9 made an exploring trip to the cinchona sections of South America. Mr. Wellcome's impromptu *Address on the Cinchona Subject*, accompanied by specimens of the bark and leaves taken by him from the cinchona trees, formed the leading feature of the meeting of the American Pharmaceutical Association in Indianapolis, 1879. (*Proc. Am. Pharm. Assn.*, 1879, p. 830.) He accepted that the use of cinchona in fevers was known to the Indians, but that they were secretive concerning it, "as is frequently the case with primitive peoples, in all parts of the world." He asks, "How is it that the term applied to cinchona bark by the Indians is *quinia-quinia*, which signifies 'medicine bark?'" He adds, "The Indians of Equador told me they regarded the bark as a specific in fever."

Taking the evidence as a whole, one may accept either of the traditions that thread the story of cinchona, that the secret of the bark was imparted by the Indians to the Jesuits, or that a Jesuit himself discovered its virtues. To the writer it seems more than likely that the natives of those malarial tropical lands made the discovery, perhaps in times lost even to tradition, than that a casual explorer of the almost inaccessible valleys of the high Cordilleras should, from the multitude of herbs, shrubs and trees, with tropical forms of vegetation of every description before him, have experimented on himself and established the qualities of the bark of this one tree. To this we might add that the art of neglecting to credit the

[1] Henry S. Wellcome is an American, connected, at the time he made the exploration of the cinchona regions of South America, with the New York firm of McKesson & Robbins, under whose auspices he made the journey. He removed to England and with Mr. Burroughs established the firm Burroughs, Wellcome & Co. The African traveler and explorer, Stanley, and Mr. Wellcome, were close friends, jointly introducing strophanthus, which see.

Digitized by Google

aborigines or the pioneer, is not wholly confined to times gone by.

INDIAN NAMES OF CINCHONA. Few historical writers disagree in that there were wide variations in the spelling of the original Indian name for cinchona, *Quinia-quinia*, among these being Quin-quinia, Quina-quina, Quinquinia and Quinaquinia. Markham,[1] p. 5, footnote, says, "In Quichua, when the name of a plant is duplicated, it almost invariably implies that it is possessed of some medicinal qualities." Flückiger says, p. 81, that *Quina-quinia* was "adopted by the Europeans, and that it became simplified into *Quinia*, *Kina*, or *China*." The last term, *China*, is much employed in Homeopathic materia medicas. Among the references to cinchona treatises given by Markham, sixteen employ the name Quinquinia as the leading title.

Irving, p. 10, states that "The natives (location not given.—*L.*) are said to have known it by the name of *Ganapride*, *Guananepide*, *Chinanepide*, and *Quananegine*." He adds, "We are not sufficiently acquainted with the language of those countries to understand the import of these names. It is probable, however, that some of them are derived from the known virtues of the remedy, and others from particular circumstances respecting its discovery and appearance."

Relph* uses the term *Quinquinia* continuously, for

[1] Clement Roberts Markham was a traveler and author. He was born at Stillingfleet, Yorkshire, England, July 20, 1830. His journeys were from the Aretic regions to the tropics, where (tropics) he became interested in cinchona. In Peru he made studies of the locations the trees occupied, and, collecting the young ones, introduced successfully cinchona to England. A pronounced champion for the correct spelling of the "Countess" name, he attacks the misspelled word cinchona, demanding that it be chinchona. His 550-page volume on the Peruvian barks, titled *Chinchona*, is a scholarly treatise by one acquainted with the subject by personal experience and literary research.

*John Relph, M.D., was physician to Guy's Hospital in 1794. His 177-page volume (see Bibliography following Cinchona) is devoted to "A new species of Peruvian bark lately imported into this country under the name yellow bark."

Digitized by Google

example, p. 9, "Before the year 1730 no botanical history of the *Quinquinia* or *Arbor Febrifuga Peruviana*, as the *Cinchona officinalis* was then called, is found worthy of attention."

The evidence presented, in our opinion, firmly establishes *Quinia-quinia* as the Indian name of cinchona, regardless of the spelling, in historical literature.

"JESUITS' BARK." It is generally accepted that cinchona owes its introduction to the Jesuit missionaries to South America, from whom it took the name "Jesuits' Bark." It also received the name "cinchona" from the Countess of Chinchon, who in Peru, through the agency of the Jesuits, had by its means been cured of a fever. It is, however, a subject of discussion, as previously stated, whether the Jesuit Father who, through the Corregidor of Loxa, introduced the drug to the physician who treated the Countess, obtained his knowledge of its virtues from the Indians. It is also a matter of discussion whether the "bark" was first brought into Europe by the Jesuits, or by the Countess of Chinchon. Let us present briefly the record.

Relph, 1794, states that "the 'Peruvian bark' was first brought to Spain in the year 1632,[1] and that its febrifuge power was recognized in that country from an actual trial of its success in 1639;[2] yet so prejudiced against it were the Spanish physicians, that, had not its use been promoted and zealously guarded by the Jesuits, the utility of this medicine might have been still unestablished." He adds that Arrot's "*Ac-*

[1] That was six years before the Countess was cured of fever, and eight years before she sent specimens of the bark to Europe. We have not been able elsewhere to verify the date 1632.

[2] This date conforms to the accepted date of the Countess' exportation.

Digitized by Google

count of the Peruvian or Jesuits' Bark, read before the Royal Society in 1737, is the first in order of time which appears to claim any consideration."

Dr. Thomas Sydenham, one of the fairest and least prejudiced authorities in medicine during the period of the cinchona controversy, uses the term *Jesuits' Bark* freely. But he employs also the terms *Peruvian bark* and *cinchona*.

Flückiger accepts practically that a Jesuit Father introduced the bark to the physician of the Countess of Chinchon, having obtained his knowledge of its virtues through the Spanish Corregidor of Loxa, Don Lopez de Canizares. He says, p. 82, "Here in the village of Malacatos, a traveling Jesuit is said to have been cured by a cacique (Indian priest) of a fever by means of cinchona, and to have extended a knowledge of the remedy." In this village, the Spanish Corregidor of Loxa, Don Lopez de Canizares, was also cured of fever in 1630. This same Don Lopez, on learning of the illness of the Countess, in Lima, 1638,[1] sent the Jesuits' bark to her physician, Dr. Juan de Vega, who cured her of the disease. In the opinion of the writer of these historical notes the chain seems complete, as follows:[2]

An Indian "medicine man," (priest), in Malacatos, near Loxa, taught a Jesuit missionary the use of the drug.

This missionary taught others, Canizares of Loxa thus learning of it.

[1] If he sent the bark to Spain at once, the date given by Ralph (1632) is tentatively verified, to the effect that cinchona as "Jesuits' bark" was used in Spain seven years before the Countess was cured.

[2] Needless is it to give references to numerous unmentioned prints that touch this subject. Authorities mentioned in the text are voluminous in themselves and all cite others that will keep one long busy if ultra-research in cinchona is desirable.

Digitized by Google

Canizares sent the bark to Juan de Vega, the physician treating the Countess of Chinchon, wife of the Viceroy of Peru.

On her recovery, the Countess sent the bark to Europe.

This leads to the question of the European history of cinchona, and name of the drug.

THE EUROPEAN NAME.—CINCHONA or CHINCHONA. Peru was invaded and subjugated by the Spaniards in 1513. Enormous riches were obtained by them, but the knowledge of cinchona, most precious of all the gifts of Peru, lay dormant for more than one hundred years.

In 1628 the fourth Count of Chinchon was appointed Viceroy of Peru, and with his wife reached Lima in 1629. In 1638 the Countess was stricken with tertian fever, then a very prevalent and a very perplexing ailment, so far as treatment was concerned. Her physician, Dr. Juan de Vega, received from the Corregidor of Loxa a "new remedy," the bark of a native tree, which he proceeded to administer to the Countess, who recovered. On her return to Spain, in 1640, the Countess brought with her supplies of the bark. This was used among the sick of her home locality, and became celebrated as a specific for fever and ague under the name "*The Countess' Powder.*" "By this name it was long known to druggists, and in commerce." (Markham). Her Peruvian physician, Dr. Juan de Vega, followed her to Spain, bringing large supplies of the bark, which he sold at 100 reals a pound. The name of the Countess of Chinchon was thus indelibly linked with this great discovery. Linnæus, in recognition, attempted to honor her by naming after her

Digitized by Google

the genus yielding the bark, but by error of spelling he omitted from the name one letter *h*, making the record cinchona, instead of chinchona. Spanish botanists discovered the error, but Linnæus having died, the correction was not made. The mutilated name now stands authoritatively, the world over, though resisted unavailingly by many authorities, and had been adopted by our own *Pharmacopeia*. But regardless of the lost letter *h*, the Countess of Chinchon has not lost the gratitude of the world.

European History of Cinchona. Here we find, interwoven, the story of commercial greed, and the efforts of the self-sacrificing pioneer; antagonisms of religious sects, and rivalries of nations; distractions bred by medical ethics and personal hatred within professional ranks.

That the Countess of Chinchon took the drug to Spain in a spirit of pure service to humanity, is incontrovertible. That the Jesuit Fathers independently, perhaps simultaneously, made the same humane offering in Italy, is likewise accepted by this writer. As already recorded, Ralph Irving states, p. 14, that "It was known in Rome in the year 1639, and that, in the year following, John (Juan) de Viga, physician to a Vice Queen in Peru, established it in Spain at *an hundred crowns a pound.*" Since de Vigo (spelled elswhere Vega) was the physician who treated the Countess, it is evident that he hastened to Spain with the new discovery. That the Jesuits were not less active is demonstrated by the fact that Cardinal de Lugo,[1]

[1] Cardinal de Lugo, a Spanish priest, was born at Madrid in 1583. He was made a Cardinal in Rome, 1643. His interest in cinchona was pronounced and served to further the term Jesuits' bark. His free distribution of the new agent to cure malaria, as well as his authoritative influence in its commerce by apothecaries, gave to the powder the name Cardinal de Lugo Powder.

Digitized by Google

Attorney-General of the order of Jesuits (Rome), began "the distribution of cinchona to the indigent sick." Thus, to use the words of Markham, p. 14, "It was a ludicrous result of its patronage by the Jesuits, that its use should have been for a long time opposed by Protestants, and favored by Roman Catholics."

Came now another opportunity for conflict. Though long previously adopted by the physicians of Paris, Spain and Italy, cinchona did not appear in England until about 1655-58, and then as a popularly advertised "nostrum,"[1] under the title, "*The excellent powder known by the name of the Jesuits' Powder.*" During the entire interval commercialism was rampant, sophistications were plentiful, and fortunes were made, as perhaps never before with a new drug. These facts became an opportunity for professional controversy, marked by much acridity. Thus the greatest gift of the botanical new world was, for half a century, praised by some, vilified by others; being made the basis of secret fever cures, it was ostracised and traduced, and narrowly escaped a total extinction by the profession.

Forty years after its introduction into England, Charles II, who reigned from 1660 to 1685, was cured of a fever by his physician, Talbor, who was knighted therefor. Talbor's secret remedy was, in 1679, purchased by Louis XIV "for 2000 Louis-d'or, a large pension and a title." (Markham). After the death of Talbor the formula was made public, its chief constituent proving to be the Jesuits' Powder, or cinchona. From that time cinchona, under its various names, became an article of commerce throughout Europe.

CINCHONA CULTIVATION. Early in the cinchona

[1] See *Professional History*, Harvey.

Digitized by Google

period came the fear that within a reasonable time the native forests would be exterminated. Exportation of the plants was naturally opposed by the Peruvian government, which desired to retain the monopoly of so important a product, but, in 1743, La Condamine attempted to transport young plants down the Amazon and thence to Paris. The box containing these was washed overboard, but subsequent attempts were more successful, and cinchona groves were established in localities appropriate as regards climate, soil and elevation. Not only was the world thus saved as concerns this valuable drug, but the yield of alkaloids was enormously increased, and the price has much decreased. Markham thus describes his experience in collecting young cinchona plants for transportation:

"In different parts of this ridge we collected 124 young *C. Calisaya* plants, most of them root-shoots, and a few seedlings. There were also two young trees bearing capsules. The *C. Calisaya* plants were all growing out of moss which covered the rock to a thickness of eight inches or a foot."

Professional History: Incomplete would be this brief history of cinchona, were no reference made to the many professional distractions connected therewith. Unbelievable, almost, were these. "The controversies that arose on the subject, between learned doctors, were long and acrimonious. Dr. Colmenero, a professor in the University of Salamanca, wrote a work in which he declared that ninety sudden deaths had been caused by its use in Madrid alone." (*Markham*). Factional, as well as personal, were the disputes over its value or harmfulness. The two sides of the controversy can perhaps be no more forcibly presented,

Digitized by Google

than in the disputants' own words, as late as 1683, (Gideon Harvey),[1] and 1715, (Sydenham)[2]:

Harvey, whose antipathy to cinchona was perhaps due to the fact that it was first introduced into England through newspaper advertisements by an apothecary, spares no words in attacking the apothecary who presumed to introduce the "Quack" remedy. Nor does he handle more kindly the physicians "who prostitute their calling by using a remedy thus introduced." Let us quote:

"This Jesuits' Powder is not a medicine newly found, but revived by a *debauched Apothecaries' Apprentice of Cambridge*, in the application to all intermittent Feavors, and he in this empirical practice, is most diligently imitated by our most famous Physic Doctors, as their *Esculapius* and first master. (A hopeful tribe in the meantime that shall leave Sense, Reason, and Dogmata, to follow a Quack or Empirick)."[3]

The opinion of Dr. Harvey concerning the "Fathers Jesuits whose name is put upon the parcel,"[4] is expressed as follows:

"However, I am of the opinion that the aforesaid drug is artificially prepared, the tree spoken of, or some other like it, affording nothing but wood, into which the bitter taste is immitted, by macerating it a convenient time in the juice of a certain Indian plant, to which that penetrating bitterness is peculiar."

[1] See note 1, page 76.

[2] "The English Hippocrates," whose work on fevers, published in 1666, gave cinchona a hearty welcome. This was naturally offensive to the anti-cinchona faction, as shown by the extracts on pages 75, 76.

[3] To take from the world's products, medicines as well as foods, introduced by parties engaged in commerce, would impoverish humanity. And yet the art of thoughtlessly sneering at the "Commercial" man is to some a pleasant pastime.

[4] This is the only reference we have noticed concerning the method of distributing Jesuits' Powder. Concerning the amount of the powder and the price, Harvey states, page 149, "a crown an ounce."

Digitized by Google

Harvey thus continues the discussion:

"After all, I could wish these Fathers had kept their *Indian Bark* to themselves, and sure I am, hundreds would be on this side the Grave, whose bones are now turned into the first element."

In this sentence Harvey, rather gently, introduces his opinion of the *effects* of "this terrible scourge." From his chapter bearing the heading, "*Proving that the Jesuits' Powder never yet cured any remitting fever*," let us quote:[1]

"That many Noblemen, and hundreds of others, within these few years, being seized with this popular feavor, and managed with the Jesuits' Powder, have died, or more properly been manslaughtered by their physicians, needs no confirmation." "They (the physicians using Jesuits' Powder) have killed thousands, and never yet cured any one man, excepting possibly three or four among a million, whose robust natures neither Disease nor Remedy could destroy." As a specific case Dr. Harvey cites a man "of illustrious extraction," whose treatment, and result thereof, he gives, as follows: "By as much as the Cinchona abated the Paroxysms of his Tertian, in an equal scantling it augmented his continual Feavor into a burning, and at last by its frequent exhibition *Jesuited* him out of his being."

Concerning the after effects of cinchona Harvey writes as follows: "Agues can not otherwise be termed cured by the Jesuits' Bark, but only stopped. The fits upon some short interval do return. Worse diseases are engendered as Dropsy, Consumption, Scurvy, or twenty other Distempers that either render the party

[1] Bear in mind that this is written by the "physician in ordinary to His Majesty," nearly fifty years after cinchona's introduction in Europe.

Digitized by Google

his whole lifetime extremely crazy or kill him outright."

Concerning the selection of a physician, Dr. Harvey says: "If you shall meet with a physician that can safely, and not over speedily Cure you, without giving the Jesuits' Powder, never meddle with the Jesuit, with whom the less a man has to do either sick or well, its the better."[1]

In the closing chapter of his book Dr. Harvey viciously attacks *"The Conclave of Physicians"*[2] who change their methods of treating fever (examples given) as the years pass until finally "they fall into an empirical course, as exhibiting *Jesuits' Bark* against all continual and intermittent fever, which now (*Jesuits' Bark*) by all men is judged to be more fatal than any of the former.

Quite different in tone, and more effective, is the argument of the staunch supporter of cinchona, Dr. Thomas Sydenham, in *"The Whole Works,"* 1715.[3] His moderation, "viewing a disease as a thing in itself", is shown by the following passage from his Preface: "If any one should object here, that we had long ago a sufficient number of Specific Remedies, this very Man, if he will make diligent search, would

[1] These rather coarse arguments (the more vicious not reproduced), might lead one to consider the author a mountebank. But his record, as given in Lippincott's Biographical Dictionary, is as follows:

"Harvey (Gideon), an English physician and writer, born in Surrey, was medical attendant of Charles II in his exile, and was subsequently physician to William III. Died in 1700."

[2] Evidently the section of the Medical Profession with which he did not affiliate. Particularly vicious is he against the "Paris Conclave" and the eminent English anatomist, Dr. Thomas Willis, to whom he devotes Chapter XVII, titled "Willis, his Hypothesis of Agues is Ridiculously Erroneous."

[3] The Translator's Preface from the Latin edition (by John Peachey, M.D.) is dated 1711. The Author's Preface, undated, follows. The Translator's English volume is dated 1715. The Author's final word (see page 78) makes the date of his last contribution September 29, 1686.

Digitized by Google

soon be of another mind; for the *Peruvian Bark* is all the Specific we have."

The formula of the ague remedy used by Sydenham in the epidemic of 1681, is as follows: "Take of the Jesuits' Powder one Ounce, of the Conserve of Red Roses, two Ounces, mingle them."

Space forbids his voluminous comments on ague and its treatment, but the following extract giving his views regarding purging and bleeding in fevers, and summing up, without personalities, the prejudice against cinchona, will not be out of place:

"Therefore, whilst I considered how ineffectual this method was (the accepted course of treatment—*L.*) and also other evacuation, that is Bleeding and Purging, both whereof by relaxing the Tone of the Blood protract the Disease, the Peruvian Bark gave me the most certain hope; concerning which I can safely say, notwithstanding the prejudice of the common people, and of some of the Learned, I never saw, nor could so much as suspect any mischief would happen the Sick by the use of it. I should not doubt to give it the first place, among all the Medicines that are yet known."

In explanation of the prejudice against cinchona Sydenham says: "But the said Bark has got an ill Name, I suppose for these reasons, chiefly; First, because all the dreadful Symptoms that attend an Ague, when it has tormented an Man a long time are imputed to the Bark, *when he scarce has used it once.*"

Sydenham makes the following historical contribution as regards the introduction of cinchona into England (p. 224):

"The Peruvían Bark which is commonly called the Jesuits' Powder, about twenty-five years ago, if I

Digitized by Google

remember well, first became famous at London for curing Agues, and especially Quartans, and indeed for the very good reasons, seeing these diseases were rarely cured before by any other Method or Medicine."

With refreshing exactness Sydenham closes his remarkable work as follows (p. 453):

"And this is in manner the Sum of all, which I have hitherto known concerning the Cure of Diseases, *viz.* to the 29th of September, 1686."

BIBLIOGRAPHY

Pharmaceutical Journals carry continuous references to Cinchona.

Blue Books, Parliamentary.

(East India Chinchona), Folio. Official correspondence on Chinchona Cultivation.

Cross, Robert.

I. Report on his expedition to secure seeds of *C. officinalis*, in the Loxa forests. (Printed 1862, also in *B. B.* I. p. 170.) And other publications.

DeCandolle, Aug. Pyram. et Alph.

Prodromus systematis naturalis regni vegetabilis. (Paris, 1824-48).—Notice sur les differents genres et especes dont les Ecorces ont ete confondues sous le nom de quinquina. (Bibliotheque Universelle de Geneve xiv. annee Sciences et arts, Geneve, 1829.)

De la Condamine, Ch. Mar.

Sur l'arbre du Quinquina. (Memoires de l'Academie royale des sciences de Paris, 1738, iv. pp. 226-243.) And other publications.

DeVrij, Dr. J. E.

De Kinakultuur op Java op het einde van het jaar 1859, kort beschreven door Fr. Junghuhn en J. E. de Vrij. (Nat. Tydschr. voor Ned. Ind. xxi. p. 177.) And other publications.

Digitized by Google

Flückiger, Friedrich A., and Hanbury, Daniel, F. R. S.
Pharmacographia. A History of the Principal Drugs of Vegetable Origin, met with in Great Britain and British India. By Friedrich A. Flückiger, Phil. Dr., Professor in the University of Strassburg, and Daniel Hanbury, F. R. S., Fellow of the Linnæan and Chemical Societies of London. Second Edition. London: 1879.

Flückiger, Friedrich A., Ph. D.
The Cinchona Barks: Pharmacognostically Considered. By Friedrich A. Flückiger, Ph.D., Professor in the University of Strassburg, Germany, and Author of Pharmaceutical Chemistry. Translated from the Original Text, with Some Additional Notes, by Frederick B. Power, Ph.D., Professor of Pharmacy and Materia Medica in the University of Wisconsin. With eight lithographic plates and one wood-cut. Philadelphia: 1884.

Harvey, Gideon, M.D.
The Conclave of Physicans, Detecting Their Intrigues, Frauds, and Plots, against their Patients. Also a Peculiar Discourse of the Jesuits' Bark: The History thereof, with its True Use, and Abuse. Moreover, a Narrative of an eminent Case in Physick. By Gideon Harvey, M.D., Physician in Ordinary to His Majesty. London: Printed for James Partridge at the Post-house between Charing-Cross and Whitehall. MDCLXXXIII.

Hesse, Dr. Oswald.
Ueber die humusartigen Bestandtheile der Chinarinden. (Journ. de Pharm. xxxv. p. 386. Liebig, Annal. cx. p. 194.) And other publications.

Hooker, Sir Joseph D., K.C.S.I., C.B.
On the *C. officinalis*, with plate. (Botanical Magazine, vol. lxxxix. 1863, tab. 5364.) And other publications.

Howard, John Eliot, F.R.S.
Illustrations of the Nueva Quinologia of Pavon. Folio, 163 pages and 30 coloured plates. (London, 1862.) And other publications.

Digitized by Google

Irving, Ralph.

Experiments on the Red and Quill Peruvian Bark: with Observations on Its History, Mode of Operation, and Uses; and on some other Subjects connected with the Phænomena and Doctrines of Vegetable Astringents. Being a Dissertation which gained the First Prize given by the Harveian Society of Edinburgh for the year 1784. By Ralph Irving. Edinburgh: MDCCLXXXV.

Jussieu, Joseph de.

Reflexions sur deux especes de quinquina recemment decouvertes aux environs de Sante Fe. (Histoire de la Societe de medecine de Paris, 1779, p. 252-263.) And other publications.

LaFontaine, Jean de.

Poeme du Quinquina et autres ouvrages en vers. (Paris, 1682. 12mo. p. 242.)

Lambert-Aylmer Bourke.

An illustration of the genus Chinchona, comprising descriptions of all the officinal Peruvian barks, including several new species. Baron de Humboldt's account of the Chinchona forests of South America, and Lambert's memoir on the different species of Quinquina, etc. (London, 1821.)

Lindley, J.

Flora Medica. A botanical account of all the more important plants used in medicine in different parts of the world. (London, 1838.)

Lippincott's Pronouncing Biographical Dictionary.

Universal Pronouncing Dictionary of Biography and Mythology. By Joseph Thomas, M.D., LL.D. Philadelphia: 1890.

Markham, Clements Robert, C.B.

Travels in Peru and India while superintending the collection of Chinchona plants and seeds in South America, and their introduction into India. Maps and Illustrations. 8vo. pp. 572. (Murray, 1862). And other publications.

Digitized by Google

Markham, Clements R., C.B., F.R.S.

Peruvian Bark. Popular Account of the Introduction of Chinchona Cultivation into British India. By Clements R. Markham, C. B., F.R.S., 1860-1880. With Maps and Illustration. London: 1880.

Martindale and Westcott.

The Extra Pharmacopœia of Martindale and Westcott, revised by W. Harrison Martindale, Ph.D., Ph. Ch., F.C.S., and W. Wynn Westcott, M.B. Lond., D.P.H. London, 1920.

Mutis, Dr. Jose Celestino.

El arcano de la quina. Discurso que contiene la parte medica de las cuatro especies de Quinas officinales. Obra postuma. Dala a luz publica, aumentada con notas, un apendice muy interesante y um prologo historico el Doctor Don Manuel Hernandez de Gregorio, Boticario en la Corte. (Madris, 1828. 8vo., pp. 263.) And other publications.

Pavon, Don Jose.

Flora Peruviana et Chilensis. (Madrid, 1798-1802. Folio. 4 vols. 425 plates.) And other publications.

Pelletier, Dr. Joseph.

Observations medicales sur l'emploi des bases salifiables des quinquinas. (Journ. de Pharm. vii. p. 128, 1821.) And other publications.

Pelletier et J. B. Caventou.

Recherches chimiques sur les Quinquinas. (Annales de chimie, xv. p. 289, 1820; Journ. de Pharm. vi. p. 5; vii. p. 49.) And other publications.

Pereira, Dr. Jonathan, M.D., F.R.S.

The elements of Materia Medica and Therapeutics. (4th edition, vol. ii. Part ii. Article "Chinchona," pp. 70 to 152. Longman, 1857.)

The Pharmacopœia of the United States of America.

Ninth Decennial Revision, and other Pharmacopœias.

Planchon, Gustave.

Des Quinquinas. (Paris et Montpellier, 1864, 8vo, 150 pp.) An English translation, under the title "Peruvian

Digitized by Google

Barks," was printed at the India Office in 1866, with a preface by Clements R. Markham.

Pritchett, G. J.

Correspondence relating to employment to obtain plants and seeds of the grey bark species of Cinchona in the forests of Huanuco. (B. B. I. p. 119.) And other publications.

Relph, John, M.D.

An Inquiry into the Medical Efficacy of a New Species of Peruvian Bark, lately imported into this country under the name of Yellow Bark; including Practical Observations respecting the choice of bark in general. By John Relph, M.D., Physician to Guy's Hospital. London, 1794.

Royle, Dr. Forbes, M.D.

A Manual of Materia Medica and Therapeutics. Article "Chinchona." (London, 1847, 8vo. 2d ed. 1853. 3d ed. 1856. American ed. by J. Carson, M.D., Philadelphia, 1847.) The Chinchona article was printed separately. And other publications.

Ruiz, Don Hipolito.

(See Pavon.) Quinologia, o tratado de arbol de la Quina o Cascarilla. (Madrid, 1801, 4to, pp. 154.) And other publications.

Ruiz, Don Sebastian Josef Lopez.

Defensa y demonstracion del verdadero descubridor de las Quinas del Reyno de Santa Fe, con varias noticias utiles de este especifico, en contestacion a la memoria de Don Francisco Antonio Zea. (Su autor el mismo descubridor. "Has ego Chinchonas repèri, tulit alter honores." (Madrid, 1802.)

Spruce, Dr. Richard, Ph.D.

Notes of a visit to the Chinchona forests of the western slope of the Quitenian Andes. (Journal of the Proceedings of the Linnæan Society, vol. iv.) And other publications.

Sydenham, Dr. Thomas.

The Whole Works of that Excellent Practical Physician, Dr. Thomas Sydenham. Wherein not only the History and Cures of Acute Diseases are treated of, after a New and Accurate Method; but also the Shortest and safest Way of

Digitized by Google

Curing most Chronical Diseases. The Sixth Edition, corrected from the Original Latin, by John Pechey, M.D., of the College of Physicians in London, 1715.

Vincent, Benjamin.

Haydn's Dictionary of Dates and Universal Information Relating to all Ages and Nations. By the late Benjamin Vincent. Revised and brought up to date by eminent Authorities. Twenty-third Edition. The London Publishing Co., 1904.

Weddell, Dr. H. A.

Histoire Naturelle des Quinquinas, ou Monographie du genre Chinchona, suivie d'une description du genre Cascarilla et de quelques autres plantes de la meme tribu. (Paris, 1849. Folio. 34 plates, map, pp. 108.) And other publications.

Wellcome, Henry S.

"A Visit to the Native Cinchona Forests of South America." Proceedings of The American Pharmaceutical Association, twenty-seventh Annual Meeting, Indianapolis, Ind., pp. 814-830 inclusive.

Wootton, A. C.

Chronicles of Pharmacy. By A. C. Wootton. Vols. I and II. London, 1910.

– CINNAMOMUM, CASSIA (Cinnamon)

Official, in every edition of the *Pharmacopeia*, from 1820.

Probably this is the first spice sought in the commerce of the Orient or from the Indian Ocean, its early record being lost in antiquity. It is mentioned as a precious spice in the Psalms, Proverbs, Ezekiel, Revelation, etc., and by the ancient historians Theophrastus (633), Herodotus (314a), Galen, (254a), Dioscorides, (194), Pliny (514), Strabo, and others. No distinction was then drawn between cinnamon and cassia, the dif-

Digitized by Google

ference being considered one of quality only. Cinnamon and cassia are mentioned as ranking in value with gold, ivory and frankincense, and as being among the most costly of the offerings in the temple of Apollo in Miletus, B. C. 243. No mention is made in any old historical document of its being derived from Ceylon. It is accepted as being mentioned in the Chinese herbals from 2700 B. C. to 1200 B. C. Many varieties of the tree are found in India, as well as in Ceylon, in which country, however, no mention of cinnamon is made prior to the thirteenth century. Cassia and cinnamon were employed as spices and remedies, especially by the aborigines, and in the religious services of the early peoples of the countries mentioned. These aromatic drugs drifted into Europe as exceedingly rare and valuable products some time before the date of the East India Company. Cassia was one of the ingredients of the embalming mixtures used by the Egyptians (see Myrrh).

Saigon Cinnamon (*Cinnamomum Saigonicum*), is derived from undetermined species of Cinnamomum. Ceylon Cinnamon (*Cinnamomum Zeylanicum*), from the cultivated *Cinnamomum zeylanicum*. Oil of Cinnamon, now official (*U. S. P.*, 1910) as *Oleum Cassiæ*, is a distillate from *Cinnamomum Cassiæ*.

COCA (The Divine Plant of the Incas) (Coca)

Introduced in 1880, under the name *Erythroxylon* (Coca). Under the better known name Coca it was official in 1890 and 1900, but was dropped as a drug from the edition of 1910, *Cocaine* and *Cocaine Hydrochloride* being here its only representatives.

Erythoxylon Coca is a small tree or bush native to the slopes of the Andes where, especially in Bolivia, large plantations are cultivated. The leaves have been highly

Digitized by Google

THE COCA COUNTRY, COLOMBIA, SOUTH AMERICA No. 1 (Page 84)

Photographed by John Thomas Lloyd.

Digitized by Google

Digitized by Google

valued, from the earliest records, by the natives of Peru, Chili, Colombia and Bolivia, the tree being called "The Divine Plant of the Incas." In 1569, Monardes (447), of Seville, published an article on the drug, reproduced, 1577, in London. (Dowdeswell, [196a]). This is among the first references to the drug in print known to us. It was followed by the botanical description, by Clusius (153), in 1605.

The history of coca, in its many phases, is presented by several travelers and authors, one of the first to introduce it to Europeans being W. J. Hooker (324), in his "*Compan'n to the Botanical Magazine,*" London, 1835.] Several pages of this work are devoted to the South American uses of coca, the same being credited to Dr. Poeppig's "*Reise in Chile, Peru, und auf dem Amazonenstrome.*" From this historical contribution we present portions, following, pertinent to the coca subject.

Among the most interesting of the more recent publicat' ns treating of coca is a large illustrated volume of near 600 pages, by W. Golden Mortimer, M. D., (451a), under the title, "*Peru, History of Coca,*" New York, 1901. From this work we also gain much insight into the early history and customs of the coca users, as indicated by the passages that follow.

That coca was honored in their sacred ceremonies by the natives of the lands producing it, is evidenced by the following "recital" (451a) addressed to the sovereign:

"Oh, mighty lord, son of the Sun and of the Incas, thy fathers, thou who knoweth of the bounties which have been granted thy people, let me recall the blessings of the divine Coca, which thy privileged subjects are

Digitized by Google

permitted to enjoy through thy progenitors, the sun, the moon, the earth, and the boundless hills."

A plant so regarded necessarily fell under the adverse criticism of the devoutly religious, early Spanish explorers, who naturally directed their efforts against everything that, in their opinion, constituted a part of heathen worship, and diverted the natives from the true God. This is shown by the following quotation from Mortimer (451a):

"In 1569 the Spanish audience at Lima, composed of bishops from all parts of South America, denounced Coca because, as they asserted, it was a pernicious leaf, the chewing of which the Indians supposed gave them strength, and was hence '*Un delusio del demonio.*' "

In this connection the following quotation will indicate how distasteful are the methods of the natives, even yet, to those whose first duty consists in suppressing such ceremonies as are therein described:

"When the period for departure (on a dangerous journey. *L.*) actually arrives, the Indians throw Coca in the air, just as did the Incan priests of old, to propitiate the gods of the mountains, who, presumably, do not wish their domains invaded."

The native Indian use of coca was unquestionably exhibited where it was necessary for men to make the most exhausting physical effort, as the Indian "runners" of the Andes, carrying with them a modicum of food or other burdens. A few coca leaves sufficed as a hunger pacifier, and upon this as a basis the runners underwent the most exhausting and exacting journeys. It was accepted by observing travelers that the leaves, being chewed, would yield an abundance of "vital strength." The endurance of people thus employing

Digitized by Google

the drug is noted also by the Jesuit Father Blas Valera under the name *Cuca*. After observing the methods of the Jesuit explorers, he writes as follows:

"It may be gathered how powerful the *Cuca* is in its effect on the laborer, from the fact that the Indians who use it become stronger and much more satisfied, and work all day without eating."

In further support of this phase of the coca subject, Dr. Poeppig, in the beginning of the last century, records as follows, in his work on Chili and Peru:

"The miner will perform, for twelve long hours, the formidably heavy work of the mine, and, sometimes, even doubles that period, without taking any further sustenance than a handful of parched maize, but every three hours he makes a pause for the purpose of chewing Coca (*coquear*). He would work ill and reluctantly, if the proprietor let him want his favorite herb. . . . The same holds good with the Indian, who, as a porter, messenger, or vender of his own productions, traverses the Andes on foot. Merely chewing Coca from time to time, he travels with a load weighing one hundredweight on his back, over indescribably rough roads, and accomplishes frequently ten leagues in eight hours. During the Revolutionary War, the undisciplined Patriot troops, chiefly consisting of Indians from the Sierra, by dint of ample supplies of Coca and brandy, traversed long distances in a very short time, and thus became very dangerous to the Spaniards. Where Europeans would have halted and bivouacked, the ill-clad, barefooted Indians merely paused, for a short interval, to chew their Coca." From the "*Reise in Chile, Peru,*" etc. of Dr. Poeppig. *Companion to the Botanical Magazine*, by W. J. Hooker.

Digitized by Google

Mr. John Thomas Lloyd, an explorer in the Colombian Andes, who traveled in company with the Mombreros (coca users), records of them, 1912:

"On this trip the dozen Indian porters who carried our cargoes all consumed coca unceasingly while on the march. After eating a simple breakfast of ground corn porridge ('mazamora'), they would start with their heavy packs, weighing from seventy-five to more than a hundred pounds, strapped to their backs. All day long they traveled at a rapid gait, over steep mountain spurs and across mucky swamps at an altitude that, to us, without any load whatever, was most exhausting. On these trips the Indians neither rested anywhere nor ate at noon, but incessantly sucked their wads of coca throughout the entire day. At night they ate a heavy meal of either 'mazamora' or rice, sometimes with a little 'panela' (brown sugar) dissolved in hot water. Meat they seldom, if ever, tasted. Then they lay down on the cold, bare ground in a half-open shed, with little cover, awakening at daybreak to eat their breakfast and start again on a long day's journey over the rugged mountains.

"When we tried to buy coca outfits from our porters, at first we met with absolute failure, but finally persuaded two of them to part with their treasures in exchange for tin tobacco boxes and a small sum of money. We also tried to buy their supply of coca leaves and lime, but these they positively refused to sell, insisting that without the coca they could not carry their packs to the journey's end.

"These Indians we found very pleasant, always cheerful, happy, and good natured, in spite of the fact

Digitized by Google

COCA USING INDIANS ON CREST OF ANDES MOUNTAINS, COLOMBIA, SOUTH AMERICA No. 3 (Page 84)

Photographed by John Thomas Lloyd.

Digitized by Google

Digitized by Google

that their daily toil subjects them to the severest of hardships and the most frugal fare. Barefooted they travel over rocks and through swamps, amid cold rain, and penetrating mist that nearly always prevails, their wages too insignificant to mention, being but a dollar or two for the entire trip, out of which they supply their own provisions and other necessities.

"Coca-using Indians of Colombia do not *chew* the leaf, but suck the saliva-made juice from the huge boluses of coca leaves mixed with lime, stored in the cheek. So far as known, this has been the method of these people from the traditional past. These coca users are typical specimens of perfect physical manhood, being muscular and well formed. *Whether this is due to the coca, or is in spite of the coca,* is a question we did not solve. Their food is simple and sparing, consisting of corn, a little sugar, no fruits, no nuts, no fish, little meat, and occasionally beans or rice. Their endurance to both the fatigue of travel and exposure to the elements is phenomenal. From early daylight to the dusk of night they run or walk rapidly. Then, after supper (their first meal since morning), they sleep in a rude 'shack' with no other cover than their capes to protect them from the penetrating cold of the damp air and wet ground. The disposition of these Indians is exceptionally pleasant, they being ever genial and good natured. Not one sour, disagreeable, mentally unbalanced or wicked coca-using man or woman did we meet.

"During the passage through their country, the only chronic sickness that we observed among them was a severe eye affection, due probably to the smoke of

Digitized by Google

their houses. To our eyes, this smoke was unbearably irritating."—See *Coca, "The Divine Plant of the Incas,"* by John Uri Lloyd.

[Notwithstanding all this evidence, fortified by repeated experiences of travelers, the world of scientific medicine ignored, or even ridiculed, the use of the drug until its introduction in England in the latter part of the last century (about 1870) forced those concerned in authoritative medicine to give it some recognition.] Numerous experimentations on its composition had been made, in 1850, by Dr. Weddell and others, who (both before and after that date) tried vainly to discover an energetic constituent of the drug. It was at first believed that the leaves owed their inherent qualities (if they had any, which was questioned), to some volatile principle, a supposition that proved a fallacy, other than in the discovery of the volatile base named by them *hydrine*, which did not at all represent coca, and which is no longer mentioned. However, the persistent reports concerning the beneficial use of coca, and its reputed powers as an empirical substance that was creeping into the use of practicing physicians, led such chemists as Hesse, Niemann, Stanislas, Martin, Maisch, Lossin, Woehler, and many others, to repeated chemical examinations of the drug and its qualities, resulting in a number of products, such as coca-wax, coca-tannic acid, and even of several alkaloidal bases, including one named *cocaine*, this alkaloid being described in 1860 by Niemann, an assistant of Professor Woehler, of Göttingen, Germany. But previously (1855), Gardeke had given the name *erythroxyline* to the crystalline alkaloid he had obtained. Cocaine is not, therefore, a recent discovery.

Digitized by Google

Numberless are the publications now bearing on the chemistry of the alkaloids of coca. Among them, from one by the chairman of our committee, a brief abstract is as follows:

"In 1893, Dr. A. R. L. Dohme contributed to the *Proceedings American Pharmaceutical Association*, pp. 159-165, a paper touching briefly the history of coca, but more particularly the assay of Huanuco leaves (*Erythroxylon Bolivianum*) and Truxillo leaves (*Erythroxylon Spruceanum*), Dr. Burck being authority for names. His excellent micro-sections of the leaves illustrate graphically the distinctions, summed up as follows:—'The distinctive differences to be noted are the apex of the midrib in the case of the Huanuco leaves and its absence in the case of the Truxillo leaves.'

"In 1895 (ibid) Dr. Dohme continued the subject (pp. 268-9), demonstrating how alkaloidal values of the same drug varied under different assay processes. This phase is of great interest, but lies in the field of alkaloidal history, rather than that of the crude drug."[1]

Notwithstanding the evidence of the energy of coca on the South American Indians, and the identification, half a century ago, of its now well-known alkaloid, *cocaine*, coca was long thereafter considered as physiologically inert, or as simply a mild stimulant, like tea. Its alleged properties were deemed legendary and imaginary, and its alkaloid was regarded as similar to caffeine, both in constitution and qualities, until Koller,

[1] The researches of Dr. Dohme, as well as those of Dr. Eberhard (see Ipecac, Rhamnus Purshiana, and other citations in this volume), were contributions to science, under the opportunities afforded by the Laboratory of the firm of manufacturing pharmacists, Sharp & Dohme, Baltimore, Md. This long established firm has, since its foundation, in the early part of the last century, been exceptionally instrumental in the advancing of scientific pharmacy. No better or more enthusiastic friends to American pharmacy has this writer known than the founders of Sharp & Dohme, Mr. Louis Dohme, the uncle, and Mr. Charles Dohme, the father of Dr. A. R. L. Dohme, Chairman of our Committee.

Digitized by Google

in 1884, confounded the professional world, as well as that of science, by announcing the marvelous qualities of cocaine as a local anesthetic. In this connection we may further call attention to the fact that previous investigators of coca had already employed the physiological method of injecting the alkaloid cocaine into the veins of the lower animals, as well as the utilization of other "scientific" methods of determining its value, such laboratory investigations being accepted as conclusive evidence of the fact that coca, other than as a mild stimulant, like tea or coffee, was *worthless and inert*, and that its alkaloid, cocaine, was similar in effect to caffeine. Physicians using coca were made subjects of ridicule, as being incapable of judging a remedy's qualities; pharmacists making preparations of the drug were looked upon askance, as being concerned in a fraud, while the natives who employed it in their daily life, as well as the travelers who were impressed by what they had observed of its effects, were regarded as involved in ignorance, or imbued with superstitious imaginings. Into these classes were cast such men as Poeppig, von Tschudi, Scherzer, Stevenson, Weddell, Spruce, Markham and others, both scientists and observing travelers, who spoke from personal observation or experience, as well as such balanced commentators as Sir W. J. Hooker, who accepted the energetic action of coca as an established fact. Although other pessimists contributed in the same direction, the most "authoritative investigations" to the discredit of coca appeared in the London *Lancet*, 1876, and in the *Edinburgh Medical Journal*, Vol. XIX, 1873, which may be summarized as follows:

G. F. Dowdeswell, B. A., of London, England, being

Digitized by Google

conversant with the repute of coca and much interested in the subject, determined to establish its position unquestionably, by personal experimentation in a scientific way. With this object, he made a careful study of its record and reputed action. He took pains to credit by reference those who had previously made reports, describing in detail the processes of the native coca users, and including the experiments of Dr. Alexander Bennett, 1873, (55b), in which the physiological action of cocaine on frogs, mice and rabbits gave no therapeutic promise of individual characteristics, other than the suggestion that it paralleled caffeine, theine and theobromine, Bennett's summary being as follows:

"When we compare this cocaine with theine, caffeine and guarana, we find that if it is not identical with these substances, it is intimately related to them in chemical composition."

The investigator had not enough cocaine to give completely its action on temperature and the glandular secretions, but adds that, as compared with caffeine, theine and so forth, "in every other respect cocaine had similar action," thus giving it no quality of its own. (55b).

Having reviewed the literature on coca, (including Bennett's physiological failures with cocaine), Dowdeswell next obtained specimens of the drug, of unquestioned quality. He then interested in his work such authorities as Professor Ringer, who furnished instruments of "perfectly accurate result," and the conspicuous Professor Murrell, of University College. The preparations employed were made by the well-known English chemist, Garrard, to whom Dowdeswell refers as follows:

Digitized by Google

"All of these were well prepared by Mr. Garrard, of University College Hospital, who has taken much interest in the subject, and who has also very successfully obtained the alkaloid and the volatile constituent of the leaf, and is still continuing an investigation of its pharmaceutical properties, for which his skillful preparations of other previously unknown alkaloids, as of jaborandi, eminently qualify him."

The preparations made by Garrard not only paralleled the processes of the native users of coca, but also included others, suggested by his own chemical and pharmaceutical knowledge. The experimentation considered, in detail, bodily conditions, rate of pulse, temperature, urine, urea excretion, etc., etc., as influenced by coca. Two detailed tables give the results, which, to the utter disparagement of coca, Dowdeswell sums up as follows: (196a)

"It has not affected the pupil nor the state of the skin; it has caused neither drowsiness nor sleeplessness; assuredly it has occasioned none of those subjective effects so fervidly described and ascribed to it by others—not the slightest excitement, not even the feeling of buoyancy and exhilaration which is experienced from mountain air, or a draught of spring water. This examination was commenced in the expectation that the drug would prove important and interesting physiologically, and perhaps valuable as a therapeutical agent. This expectation has been disappointed. Without asserting that it is positively inert, it is concluded from these experiments that its action is so slight as to preclude the idea of its having any value either therapeutically or popularly; and it is the belief of the writer, from observation upon the effect on the pulse, etc., of

Digitized by Google

tea, milk-and-water, and even plain water, hot, tepid, and cold, that such things may, at slightly different temperatures, produce a more decided effect than even large doses of Coca, if taken at about the temperature of the body."

The result of the investigations of these eminent authorities, in connection with the physiological experimentations with cocaine, demonstrated to the world of science that this drug was, at the very best, merely a something in the line of the caffeine-bearing stimulants, such as tea and coffee, and, next, that instead of being of any value whatever, or of possessing any inherent quality whatever, it was positively inert, having

"an action so slight as to preclude the idea of its having any value, either therapeutically or popular;" that it has no greater effect on the pulse than

"tea, milk-and-water, or even plain water, hot, tepid and cold;" that it

"occasioned none of those subjective effects so fervidly described and ascribed to it by others—not the slightest excitement, nor even the feeling of buoyancy and exhilaration which is experienced from mountain air, or a draught of spring water."

In this connection, it may be added that Professor Roberts Bartholow, M. D., accepted that "it acts like theine and caffeine as an indirect nutrient," etc. (*Therapeutic Gazette*, July, 1880.) (564.)

Just at that time the American "New Remedy" craze of the 70's was at its height. Among the substances eulogized was coca, which had received a position in the Prices Current of all the American manufacturing pharmaceutical establishments, as well as

Digitized by Google

the eulogistic commendations of "country" physicians in American medical prints.

Paralyzing to such as these were the adverse "authoritative" reports concerning the worthlessness and inertness of coca (196a). All this, together with the variations in quality of the commercial article, which were later confirmed by Professor H. H. Rusby, M. D., (564), very much disturbed the talented, careful and exceptionally conscientious chemist, Dr. Edward R. Squibb, of Brooklyn, N. Y., the leading American manufacturing pharmacist of that date, who accepted the statements of Dowdeswell, to the discredit of the practicing physician. In the height of the commercial demand for coca, Dr. Squibb determined to sacrifice his commercial opportunities to his professional ideals, and to accept the provings of "laboratory physiologists," by excluding all coca preparations from his pharmaceutical list, commending tea and coffee in their stead. He writes as follows in his *Ephemeris*, (610a), July, 1884:

"Almost every purchase (of the crude drug—*L.*) has been made on mental protest, and he (Squibb) has been ashamed of every pound of the fluid extract sent out, from the knowledge that it was of poor quality; and there seems to be no more prospect of a supply of a better quality than there was this time last year, because so long as an inferior quality sells in such enormous quantities at good prices, the demands of trade are satisfied.

"Under this condition of the markets, the writer has finally decided to give up making a fluid extract of coca, and has left it off his list, adopting a fluid extract of tea instead, as a superior substitute, for those who

Digitized by Google

COCA MARKET; COLOMBIA, SOUTH AMERICA No. 2 (Page 84)

Photographed by John Thomas Lloyd.

Digitized by Google

Digitized by Google

may choose to use it, and regrets that this course was not taken a year ago."

Dr. Squibb, however, with even more than his usual carefulness and desire to extend professional courtesy to one and all, perhaps guided also by a latent questioning of the possibility of paralleling the action of a drug in abnormal conditions of the human being by a study of the action of that drug on the lower animals, or on a man in health, refers to the fact that "authorities are often in error or opposed in opinion," fortifying this statement in the following words (610a):

"Conflicting and contradictory testimony from competent authority is not uncommon in therapeutics, and the reasons for it are well recognized in the impossibility of an equality in the conditions and circumstances of the investigations, and hence the general decision commonly reached is upon the principles of averages."

And yet the physiological investigations of Dowdeswell seeming to be incontrovertible, Dr. Squibb adds:

"But there has been no observer on either side whose researches have been anything like so thorough, so extended, or so accurate as those of Mr. Dowdeswell. Indeed, no other account has been met with wherein the modern methods of precision have been applied to the question at all; the other testimony being all rather loose and indefinite, often at second or third hands, or from the narratives of more or less enthusiastic travelers. But if Mr. Dowdeswell's results be accepted as being conclusive, the annual consumption of 40,000,000 pounds of Coca, at a cost of $10,000,000, promotes this substance to take rank among *the large economic blunders of the age.*"

Now came the "irony of fate!" Scarcely had the ink

Digitized by Google

dried in the publication (*Ephemeris*) recording Dr. Squibb's faith in the results of the physiological investigations of Bennett and Dowdeswell, before it was announced in a letter to Dr. Squibb, dated September 19, 1884, from Dr. Henry D. Noyes, a physician of New York then in Kreuznach, Germany, (*Ephemeris*, Nov., 1884), (610a), that a medical student named Koller, of Vienna, had discovered that a solution of hydrochlorate of cocaine was possessed of marvelous qualities as a local anesthetic.

This letter of Dr. Noyes was immediately given a setting, or reference was made thereto, in every pharmaceutical and medical journal of America. Such an authority as Dr. D. Hayes Agnew, of Philadelphia, wrote as follows in the *Medical Record*, October, 1884 (418a):

"We have today, (October 18, 1884), used the agent in our clinic at the College of Physicians and Surgeons, with most astonishing and satisfactory results. If further use should prove to be equally satisfactory, we will be in possession of an agent for the prevention of suffering in ophthalmic operations of inestimable value."

Came also leading editorials in the various publications on medicine and pharmacy, of which that from the pen of Mr. Henry B. Parsons, editor of the *Druggists' Circular*, is typical. From this we quote (199a):

"For the past month American medical journals have fairly bristled with reports from various hospital surgeons, and it is pleasing to note that, on the whole, the claims first made for this remedy have been sustained. It seems to be proved that, in the majority of cases, the application to the eye of a few drops of a 2 or 4 per cent solution of this salt will produce a more or less complete, but transient, insensibility to pain, with enlarge-

Digitized by Google

ment of the pupil. Operations upon the conjunctiva and cornea ordinarily requiring the use of chloroform or ether have been performed upon patients conscious of everything being done, but saved from pain by the application of a weak aqueous solution of this salt. In several operations for removal of hard cataract, the patients complained of no pain whatever, the entire conjunctival surface being insensible to repeated pinchings with the surgeon's forceps. The only sensation described was that of 'numbness and hardness.' After a time the eye returns to its normal sensitiveness, and there seems to be no troublesome local after-effects."

Let it be noted that in the beginning cocaine was commended in operations on the cornea of the eye, its latest application in minor operations in surgery, dentistry, and elsewhere, being at that time not even theoretically anticipated.

With a spirit that can not be too highly commended, Dr. Squibb, accepting the facts of the present, now threw all his efforts into a new investigation of coca and its now famous alkaloid, with such success that his process of manufacture of cocaine is yet a standard, and his writings on this alkaloid yet authority. Occupying many pages of his *Ephemeris*, 1884–5, they stand as a lasting memorial to the lofty methods of this exceptionally fair man, who took pleasure in publicly correcting an error, and whose every record in American pharmacy is monumental.

The discovery of the anesthetic qualities of coca marked the beginning of an epoch in medication whose story, in connection with the past, pleads irresistibly for tolerance of thought and action

Digitized by Google

toward men *who know that which they know* by reason of *personal experience*, and the art of empirical observation. Perhaps in no other instance has the almost hopeless cry for recognition of the facts developed by empiricism been more prominently illustrated, than by the story of this drug. [One of the greatest blessings to humanity when properly used, and one of its greatest curses when used indiscreetly, coca was for nearly three centuries neglected by men of science, and subjugated by professional prejudices.] At last the eminent botanist and pharmacologist, Henry H. Rusby, M. D., (564), was led to undertake a journey to South America in behalf of science. In that journey the study of coca was a dominant factor, and for founding that enterprise the pharmaceutical house of Parke, Davis & Company, of Detroit, deserves great credit. The result of Dr. Rusby's study is presented in the *Therapeutic Gazette*, (634), 1886 and 1888, in an exceptionally valuable treatise that is today not less important than when contributed by Dr. Rusby.[1]

Needless is it to do more than refer to the marvelous reaction that followed Koller's discovery of the power of cocaine as a local anesthetic. A library would be required to hold the works eulogistically devoted to the new discovery. A volume would be required merely to print the names of the enthusiastic writers on coca, formerly so discredited.

In closing this subject to which, by reason of its importance, we have given so much space, let us do tardy justice to the prophetic words of the poet, who so often foresees that which others either neglect altogether, or

[1] It pleases us much to be able to add that since the above was written, the H. K. Mulford Company, Philadelphia, has arranged for Dr. Rusby to make another exploration trip to South America under their auspices. Details are not as yet available to us.

Digitized by Google

discredit. Nearly three hundred years ago the poet Cowley (170a), in his *Sex Libri Plantarum*, published in London in 1672, not only mentions coca, known to him only through the tales of travelers, but in terms that today need no apology, sets forth that marvelous drug. The passage is so remarkable that we can not resist placing it before our readers, (the translation from the original Latin of Cowley being made by Miss Margaret Stewart). The poet, describing a feast of the gods, includes among the deities both those of the Old World familiar in mythology, and the less well-known deities of the New World. Venus presides over the feast, and Bacchus offers wine to Omelochilus, a South American deity. Pachamama, (the "skin mother"), is a leading deity of the Incas. The Quitoita, the Vicugni, and the Paci are tribes now obscurely known. The translation is almost strictly literal, but in a few lines the sense requires a somewhat free rendering. Several editions of Cowley's *"Book of Plants"* are on the shelves of the Lloyd Library. The one from which the translation is made was printed in London, 1678. The passage is as follows:

EULOGY OF COCA

From Cowley's Sex Libri Plantarum, 1672

(Translation)

The vine departs; and all the deities of the Old World applaud, and with purpled hands seize the clustered grapes. Bacchus, in jesting mood, brings a generous cup, pressed from many grapes, to Omelochilus. "Come, drink, comrade," said he. "If thou dost taste this wine, no other of the gods will be more fit than thou to tempt the crude appetites of the cannibals."

Digitized by Google

But Omelochilus, not accustomed to the acid Grecian wine, drinking it, rages in frantic wrath, and would doubtless repay the jest with blows, but fears the well-known strength and courage of the European deity. Therefore, (to be quits with his tormentor.—S.) he bids the fruits advance to strife less cruel. They all stand forth in beautiful array, displaying their various products, and like Amazons they advance, with pictured armor.

First in line, dishonored from lack of fruit,[1] stands Coca, a small tree, gleaming with slender stem. And Venus scoffs. "Truly, the race of American husbandmen have chosen with little judgment, coming into a contest as regards fertility with a dwarf eunuch as their leader." The gods shout with laughter. But Mother Pachamama rebukes the bold goddess, and defends her loved Coca. "How greatly dost thou err, Cytherea! Truly, the lustful fertility of lovers is alone known to thee. Here, thou art a bad judge. My realms, lacking sex, are to thee an unknown country. Beyond all others, everywhere, the land is fertile. This tree, at which you scoff, is perennially fertile, and ever swells with unnumbered fruits. Do you still laugh? See how full of leaves it is! *In every leaf it bears a fruit.* Nor will these leaves yield in usefulness to any fruits, from any tree. These, by the wonderful gift of Pachamacus Virococha, (who was moved to pity by the coming hardships of the land, reduced to poverty because of its too great wealth), remaining for a time in the mouth, the juice trickling thence continuously to the stomach, restore the weak, made languid by long con-

[1] Cowley was evidently unaware of the fact that the shrub coca bears a creamy white flower, and a berry somewhat like a small cranberry, red when immature, but darkening to nearly black.

Digitized by Google

tinued hunger and lengthened toil, and give back vigor to the limbs and strength to the weak body, tottering under its burden, in a manner such as ye, Bacchus and Ceres, deities both, could never do. The Quitoita, carrying three of these as supplies, for their journey, will sometimes endure for twice three days, and feasting abundantly upon these leaves, will traverse the dreadful Andes, a frightful land, situated among the highest clouds, the home of winds and rain and winter storm, and likewise thine, brave Coca, whom the warlike goddess Venus derides as an insignificant leader! Nor shalt thou be less esteemed for thy admirable qualities, illustrious Coca, than for thy services to mankind. The merchant fears not to seek thee here, to bear thee hence. Yearly he loads the groaning Vicugni and Paci in countless numbers with thy leaves, bringing a pleasing commerce to the wretched world."

Thus speaks the mother Pachamama, her skin painted with numberless figures, and with a nod bids Hovia to advance, Hovia, bearing fruits stony and despised, but ranking next in value to those of Coca, though of different kind.

COCCUS (Cochineal)

Mentioned first in 1830 (New York) edition. Official in all following editions of the *Pharmacopeia*.

The cochineal insect, *Coccus cacti*, is native to Mexico and tropical America, where it feeds on favored species of cactus. These insects were thence imported into the Canary Islands, where they are now raised in large numbers, as well as in the West Indies and other countries. They are sources of great profit to the Mexicans, who, so far as known, have always been acquainted

Digitized by Google

with their quality of imparting a red color to confectionery and pastry, for which purpose, (and as the source of carmine), they are still chiefly employed. In domestic medicine, this drug has been commended in whooping cough and neuralgic affections, but it has never been seriously considered by the medical profession.

COLCHICI CORMUS ET SEMEN

(Colchicum, Root and Seed)

Colchicum Root is official in all editions of the *U. S. P.* The 1840 edition first mentions *Colchicum Seed.*

Colchicum (*Colchicum autumnale*) was known in very early days, Dioscorides (194) mentioning its poisonous properties. It was used as a rheumatic or gout remedy by the Arabians, as noted in the writings of Tragus (650), 1552, who warns his readers against its use in gout. It was employed empirically in domestic English medicine, but was in disfavor with the medical profession, being called by them *Colchicum perniciosum*, and considered "very hurtfull to the stomacke." Wedel (672), in 1718, held colchicum in great disfavor, as indicated by the following quotation: "*Velut in fame habitum et damnatum fuit colchicum, indignum habitum inter herbas medicas vel officinales.*" (Not worthy of being classed among medicinal herbs.)

Colchicum was mentioned in the *London Pharmacopeia*, second edition, 1618, and was given an occasional place in subsequent editions, but was omitted altogether in the editions between 1650 and 1788, after which time, owing to the investigations of Störck, (617), it was again given an authoritative place.

Digitized by Google

COLOCYNTHIS (Colocynth, Bitter Apple)

Official in every edition of the *U. S. P.*, from 1820 to 1910.

Description: Persons familiar with the common watermelon vine need no description of the plant which produced colocynth apple, *Citrullus Colocynthis*, which very closely resembles a watermelon vine bearing a small, hard fruit with a bitter pulp. Naudin, a French botanist, succeeded in crossing the colocynth vine and the watermelon, producing fertile seed, thus demonstrating that they are essentially the same species. Remarkable is the relationship that exists between not only this plant and the watermelon, but other plants belonging to the Gourd family, such as the pumpkin, the squash, the melons and the cucumber. In the latter plant we also find a cathartic principle, similar to that of the colocynth. The difference between the two genera, citrullus and cucumis, is very slight. The former has solitary sterile flowers and branched tendrils, the latter has clustered sterile flowers and simple tendrils.

The colocynth plant is a native of arid soils. It has a large, fleshy, perennial root, which sends out slender, tough, angular, scabrid vine-like stems. These usually lie on the ground, for want of something upon which to climb, but if opportunity presents, they climb over shrubs and herbs by means of axillary branching tendrils. The leaves are angular, lobed, and are almost the exact duplicate of watermelon leaves. The fruit is globular, smooth, with a hard but thin rind, something like a gourd. It is filled with a soft, white pulp, in which are imbedded numerous seed. The pulp is the part used in medicine. The bitter juice has been

Digitized by Google

in Arabian literature the text for a man's disposition. Thus, Al Dalhamah is described as a bitter gourd (colocynth), a viper, a calamity. (Burton, *Arabian Nights*, Vol. II, p. 78.)

The colocynth plant occupies the vast area extending from the west coast of Northern Africa (Senegambia, Morocco, and the Cape Verde Islands), eastward through the Sahara, Egypt, Arabia, Persia, Beluchistan and through India, as far as the Coromandel Coast and Ceylon, touching northward the Mediterranean and Caspian Seas. At the Red Sea, near Kosseir, it occurs in immense quantities (239, 240). It is also found here and there in Southern European countries, e. g., Spain and the islands of the Grecian archipelago. Isolated specimens occur in the Cape of Good Hope, Japan, and Sicily, (57), and even from our own hemisphere we have recent reports of its successful cultivation, on a small scale.[1] It is suggested that birds of passage have much to do with the distribution of the seed.

In the island of Cyprus the raising of colocynth has been a source of revenue since the fourteenth century, and till the breaking out of the world's war it still formed an article of export from that country.

Colocynth is a characteristic desert plant. Hooker and Ball (323a), met with it in the oasis of Sheshuaua in Morocco, and state that in northern Africa it rarely approaches the sea shore. The fruit of colocynth is used in Morocco for the purpose of protecting woolen clothing from moths, but according to the testimony of observers, the purgative quality of the drug does not

[1] Mr. C. B. Allaire, founder of Allaire, Woodward & Co., now a resident of San Antonio, New Mexico, has investigated the native colocynths of the western deserts with a view to their introduction to American medicine.

Digitized by Google

seem to have been known to (at least valued by) the native doctors.

Volkens (664a) enumerates *Citrullus Colocynthis*, Schrader, (*Cucumis Colocynthis*, L.), among the plants growing in the Egypto-Arabian deserts, pointing to its exceedingly rapid development, especially the fruit, which attains a diameter of ten centimeters. After the vine has withered away, the fruits may be seen lying in the sands of the desert, ten to fifteen in number, about each plant.[1] Volkens saw the plant in bloom in May as well as in December, and reports that when it is torn from the ground it withers in a short time, owing, he thinks, to the delicacy of the microscopical structure of its leaves.

A brief account of the growth of colocynth in Palestine by E. S. Wallace has more recently appeared in the *United States Consular Reports*, 1895, from which we abstract points of interest as follows:

The fruit grows abundantly between the mountains of Palestine and the eastern shore of the Mediterranean, from the city of Gaza northward to Mount Carmel. The plant thrives without any attention whatever on the part of man, since the climate and soil are all-sufficient for its perfect growth—the natural requirements being merely a sandy soil, warm climate, and little moisture. The fruit which is known in commerce as the Turkish colocynth is collected by the native peasants (fellaheen) in July and August, before it is quite ripe, and is sold to Jaffa dealers, who peel it and dry the pulp in the sun. It is then molded into irregular small balls, packed in boxes and exported, mostly via England. The average annual shipments

[1] Travelers through the western desert are continually meeting these "American Colocynth" apples in scattered groups, no vine appearing.

Digitized by Google

are stated in the consular reports to be (1895), ten thousand pounds, an amount considerably reduced in later years, due, as we learn from another source, to the export tax. The report suggests that probably colocynth may be profitably cultivated in certain parts of the United States. In this connection we may point to Professor L. E. Sayre's paper on American Colocynth, (*Am. Journ. Pharm.*, 1894), (17b), and the cultivation of the drug in Montreal, as reported in 1895 by Prof. T. D. Reed (*Montreal Pharm. Journ.*, 1896). (448a). Mr. C. B. Allaire, founder of Allaire, Woodward & Company, Peoria, Illinois, investigated the "bitter apple" that, native to the American desert, is cathartic in action. For reasons commercial rather than therapeutic, this drug was not available as a competitor of imported colocynth.

The drug is imported from Spain, Trieste, Smyrna, Mogador, and elsewhere.

CONIUM (Hemlock)

All editions of the *U. S. P.*, excepting that of 1910, mention Conium, but they vary as concerns the part to be used. The early editions, including the Philadelphia edition of 1830, mention the leaves, only, of *Conium maculatum*, while the New York edition of 1830 mentions "*The Leaves and Seeds.*" The 1840 edition goes back to the leaves, while that of 1850 is the first to make official "The fruit of *Conium maculatum.*" The 1860 edition goes back to "The leaves of conium," and in 1870 we find two divisions, *Conii Folia* and *Conii Fructus, Conium Seed*, the latter being described as "The full-grown fruit of *Conium maculatum*, gathered while yet green and carefully dried." The *Pharmacopeias* of 1880 and 1890 retain this description, as does that of 1900, the wording being slightly changed, as follows: "The full-grown but unripe fruit of *Conium maculatum*, carefully dried and preserved." The edition of 1910 makes no mention of Conium.

Conium maculatum is native to Asia Minor and the islands of the Mediterranean. It has been naturalized

Digitized by Google

in North and South America and throughout England and other similar locations. It was known to the Greeks, who are said to have used it to execute criminals. Tradition has it that a decoction of this plant was the drug (*φάρμακον*) drunk by Socrates (334). Conium was long known under the name *Cicuta*, but to avoid confusion with *Cicuta virosa*, Linnæus (385), in 1737, restored its classical name, *Conium maculatum*, or poison hemlock, the word hemlock being Saxon, meaning *leek of the border*, or *shore*. Störck (617), of Vienna, in 1760, introduced conium into medicine.

- CONVALLARIA (Lily of the Valley)

Named in but two editions of the *U. S. P.*, those of 1890 and 1900.

Lily of the Valley, *Convallaria majalis*, is recorded as one of the earliest domestic remedies, being accepted by Dr. Squibb (610a) as "continuously used in medicine for several hundred years" (*Ephemeris*, January, 1884). In *The British Medical Journal*, November, 1883, Dr. Edward Drummond, of Rome, states that in a book of *Commentaries on the Materia Medica of Dioscorides*, Venice, 1621, Dr. Pietro Andrea Matthioli (414) speaks as follows of its use in cardiac diseases:

"The Germans use Lily of the Valley to strengthen the heart, the brain, and the spiritual parts, and also give it in palpitation, vertigo, epilepsy, and apoplexy, etc."

This article led Dr. Squibb, who had also received some private information in a letter "from a very careful and close observer," to favor the drug as a hopeful remedy that, in specific and restricted directions, would be better employed than digitalis. To such an extent

Digitized by Google

was Dr. Squibb impressed in its favor as to lead him to write, (1879):

"It is to be hoped that the revision committee will recognize it in the forthcoming issue of the *U. S. Pharmacopeia.*"

The commendations of Dr. Squibb were probably instrumental in obtaining for convallaria this honor, for in 1900 it obtained official recognition.

In Russia, convallaria was investigated by the medical profession as early as 1880, having long before been used in dropsy by the people. About 1883 it became fashionable elsewhere, being generally commended as a substitute for digitalis in certain specific conditions.

A study of the chemistry of convallaria antedated its use in professional medicine, for in 1858 G. F. Walz published an analysis in the *N. Jahrbuch f. Pharm.*, describing two "most important constituents," viz., *convallarin* and *convallamarin.* He states that his experiments were made long before their publication. It is to be seen that the empirical use of convallaria prevailed centuries before its employment as a remedy by the licensed profession of medicine, (1883), and that the chemist also anticipated its probable employment in therapy.

COPAIBA (COPAIFERA OFFICINALIS)

(Copaiba) Copaifera Langsdorffii

Official in every *U. S. P.*, from 1820 to and including 1910, which makes official the oleoresin derived from South American species of *Copaiba.*

On the spelling of the name of this drug we quote from a private letter from Dr. Charles Rice (548a), New York, who for several decades was Chairman of the Committee on Revision of the *U. S. Pharmacopeia:*

Digitized by Google

"I can not refer to Desfontaines' original (*Mem. Mus.* Paris, VII, 1821), (377), but to judge from the *Kew Index* and some other authorities, Desfontaines spelled the species name *Lansdorfii*. And from Desfontaines the mistake passed into many succeeding books. Even Bentley and Trimen took up the mistake, particularly emphasizing that Langsdorfii is wrong. The mistake was pointed out long ago in the *Pharmaceutical Journal*, IX, (1879), and also by Flückiger in *Pharmacographia*, (2d. ed., p. 228, footnote).

"Some of the botanical authors who happened to know better, corrected the mistake without making any remarks. Thus, for instance, Baillon has it right in all his works, for example, in *Histoire des Plantes*, II, 163; also, Rosenthal in his *Synopsis Plantarum Diaphoricarum*, p. 1046, etc. They write Langsdorffii (with g and two f's).

"George Heinrich, Freiherr von Langsdorff, was born on April 18, 1773, at Wöllstein in Rhenish Hesse, studied medicine in Göttingen, then went to Portugal, where he remained from 1797 to 1803. He then participated in Krusenstern's Russian exploring expedition, after which he became Russian chargé d'affaires in Brazil. In 1831 he returned to Germany and died at Freiburg in the Breisgau on June 29, 1852. He wrote an account of Krusenstern's expedition, under the title, 'Bemerkungen auf einer Reise um die Welt,' 2 vols. Frankfurt am Main, 1812."

Copaiba (popularly known as Balsam of Copaiba), is obtained from South America, principally from Brazil and Venezuela, being produced by numerous species of the genus copaifera. This genus belongs to the suborder of cæsalpiniaæ, of the vast order of *Legum-*

Digitized by Google

inosæ, and differs from the ordinary type of the order, as we usually know it, in having more regular flowers (papilionaceous), resembling in this respect our honey-locust (*Gleditschia triacanthos*), and coffee-nut (*Gymnocladus dioica*) tree.

The various species of copaifera growing in tropical America are usually small trees (sometimes shrubs).

Flückiger traced the record of what is probably the first printed statement regarding a resiniferous tree other than the pine, dating back to the last decade of the fifteenth century. He quotes from Michael Herr, "*Die Neue Welt der Landschaften und Insulen*," Strassburg, 1534, which contains a report made by Petrus Martys of Anghiera to Pope Leo X, wherein this tree is mentioned under the name *copei*.

The next available record dates from a publication of the year 1625, wherein a Portuguese monk, probably Manoel Tristaon (651a), of the convent of Bahia, contributes an extensive chapter on Brazil and its products. On page 1308, immediately following the description of *Cabueriba* (or Peru balsam tree), he says: "*Cupayba*. For wounds. Cupyaba is a fig tree, commonly very high, straite and big; it hath much oile, within; for to get it they cut the tree in the middest, where it hath the vent, and there it hath this oil in so great abundance that some of them doe yield a quarterne of oile and more; it is very clear of the color of oile; it is much set by for wounds, and taketh away all the skarre. It serveth also for lights and burne well; the beasts knowing the vertue thereof doe come and rubbe themselves thereat. There are great store, the wood is good for nothing."

The first explicit description and illustration of one

Digitized by Google

of the trees yielding copaiba is to be found in the joint work of Piso and Marcgrav (511), (1648), whose statements form the basis of the subsequent literature on the subject. In this connection it appears rather remarkable that the *Pharmacopeia Amstelodamensis*, sixth edition, 1630, antedating this publication, distinctly mentions *Balsam copœ yvœ*. Some of the statements of Piso and Marcgrav have given rise to discussion, the fact that Piso figured and described the flowers with five sepals, whereas they are now known to bear only four, being one of the points. The pod, however, is figured and described correctly, and the statement is made that it contains an edible nut, which the monkeys of the forest are very fond of eating. As regards the mode of collecting the balsam, Piso relates that an incision is made through the bark deep into the pith, at the season of the full moon, which causes such an abundant flow of fatty and oily liquid that twelve pounds may exude in three hours. In case no oil should appear, the opening is at once closed with wax or clay, and after two weeks the yield is sufficient to make up for the delay. The fact that the resiniferous ducts in these trees often attain a diameter of one inch, as has been observed more recently by Karsten, seems to be quite in harmony with the statement regarding the abundant yield. It is also related that frequently the balsam accumulates in these ducts and exerts pressure enough upon the enclosing wall to burst the tree with a loud report. According to Piso, the copaiba tree is not very frequent in the Province of Pernambuco, but thrives luxuriantly in the Island of Maranhao, which, he says, furnishes the balsam of commerce in great quantity. He also enumerates the many medicinal virtues of the

Digitized by Google

balsam, making the curious statement that its healing virtues are also experienced as an efficient means to check the flow of blood in the Jewish practice of circumcision.

Labat (365), reports that in 1696 he had an opportunity to observe for the first time the tree yielding copaiba in the Island of Guadeloupe. He relates in detail the manner of collecting the balsam, which he calls *huile de copau*. The vessels in which the balsam is collected are made of the fruit of the calabash, a kind of gourd. The collection, he states, takes place about three months after the rainy season; that is, in March for the countries north of the equator, and in September for the countries south of this line. The balsam, he states, closes all kinds of wounds except those inflicted by gunshot. He declares it to be a powerful febrifuge, having been used with almost marvelous effect in the fever epidemics at Rennes and Nantes in 1719.

Nic. Jos. Jacquin (338a), a noted Viennese botanist who traveled in the West Indies in Linnæus' time, first observed the tree yielding copaiba in cultivation in the village of Le Carbet at Martinique, and subsequently (1760 and 1765), described it under the name of *Copaiva officinalis*. He states that this tree was indigenous to the continent, where it grows frequently around the town of Tolu near Carthagena, promiscuously among trees yielding balsams of Tolu and Peru. Jacquin described the flower of this tree as having four petals, and the calyx as being nonexistent; yet he considers it identical with that of Piso and Marcgrav, which is, however, emphatically denied by De Tussac (656a) in *Dictionnaire des Sciences Naturelles*.

Digitized by Google

Linnæus (385), in 1762, gave Jacquin's plant the name *Copaifera officinalis*.

Until 1821 it was generally believed that *Copaifera officinalis* was the only tree yielding copaiba; in this year, however, Desfontaines, (189a), added two new species, *C. guianensis* and *C. Langsdorffii*. At the same time, Desfontaines changed the name of *C. officinalis* to *C. Jacquini*, in honor of its discoverer. The fact that Jacquin's plant was foreign to Brazil and yielded a balsam of inferior quality would indicate that it could not well have been the official balsam tree, while by reason of the publication of Piso's account, Brazil had been generally considered the geographical source of the official balsam. However, the name *C. officinalis, L.*, has subsequently been upheld, although the official copaiba balsam is now considered as being mainly derived from *C. Langsdorffii*, the species named by Desfontaines in 1821 in honor of Mr. Langsdorff, the Russian consul general at Rio Janeiro, from whom the specimens were obtained. This name was erroneously spelled "Lansdorffii" by Bentley and Trimen (57), who thus perpetrated what was undoubtedly an error of print in Desfontaines' original memoir. Soon thereafter the recorded species of copaiba increased rapidly. In 1826 Hayne (305a) (Arzney Gewaechse), published and described sixteen different species, which, however, all bear resemblances, their distinctive features residing mainly in the form and the arrangement of the leaves. Hayne especially endeavors to place the species made known by Piso, the difficulty being that this ancient work stated that the wood is colored as if with minium. The only species that, in the opinion of Hayne, would

Digitized by Google

answer that description, is *C. bijuga*, the wood of the branches of which is pale-red, which color may appear as red in the trunk of the tree. Hayne also states that copaiba is gathered from all species known to the natives, and concludes that most of the balsam is yielded by *C. multijuga* in the province of Para, a species, however, which is now questioned.

According to Flückiger (239, 240), the following species are the principal sources of the copaiba of commerce:

1. *Copaifera officinalis, L.* (Guiana, Venezuela, Colombia, Trinidad).
2. *Copaifera guianensis, Desf.* (Lower Amazon, lower Rio Negro, Cayenne, Surinam).
3. *C. coriacea, Martius.* (Bahia and Piauhy).
4. *C. Langsdorffii, Desf.* (Continental provinces of Brazil).

The number of known species has steadily increased until now the *Index Kewensis* recognizes twenty-three American and five African species.

The copaiba obtained from the vast territory of the Brazilian continent, along the Amazon and its tributaries, is collected in the shipping port of Para. Maranhao Island is also a place of export. Other shipping ports are Maracaibo and Angustura in Venezuela, Trinidad, Demerara, (British Guiana), Cartagena (Colombia), and Rio de Janeiro. This article is largely a condensation of a contribution of Dr. Sigmund Waldbott and the writer to the *Western Druggist*, Chicago.

Digitized by Google

CORIANDRUM (Coriander Seed)

Official in every edition of the *U. S. P.*, from 1820 to 1910.

Coriandrum sativum is indigenous to the regions of the Mediterranean and the Caucasus, from which it has spread throughout the temperate parts of the whole world, even to the Americas. It was mentioned by early Sanskrit writers and in the Mosaic books, Exodus and Numbers, and occurs in the famous Egyptian papyrus Ebers (213). Its fruit was used by the Jews and the Romans as a medicine, as well as a spice, in very early days. Cato (132) notes its cultivation; Pliny (514) states that it was obtained in very fine quality in Egypt, and it is frequently mentioned in the book of Apicius Cœlius (24), about the third century A. D. It is also included in the list of valuable products of Charlemagne.

CROTON TIGLIUM (Croton Oil)

The Oil of Croton Tiglium was introduced into the *U. S. P.* in 1830, being official in both the New York and the Philadelphia editions. It is official in all succeeding editions, including that of 1910, which lists it as *Oleum Tiglii* (Croton Oil).

The genus croton, established by Linnæus in 1737, is extensive, 625 species being recognized in the *Index Kewensis*. We have a number of herbaceous species in this country, but none of any economic importance. The croton plant is a native of India, and is grown all through the East Indies. It is a small tree, fifteen to twenty feet high.

Croton Tiglium is considered indigenous to Malabar, Ceylon, Amboina (of the Molucca Islands), the Philippines, and Java. Joannes Scott (588a), in his dissertation on the medicinal plants of Ceylon, (Edinburgh,

Digitized by Google

1819), states that the seeds of *Croton Tiglium*, under the name "gayapala," are a most powerful purgative, and also that the leaves are very acrid, causing an intolerable burning in the mouth and throat.

Dr. Irvine, in 1848, gave a short account of the materia medica of Patna (part of the province of Bengal), mentioning "jamalgoota," which he stated is derived from *Croton Tiglium* and several other species of croton. The croton seeds furnish a violent purge, and are made into pills with ginger and "kutkaranja or kath karanja seeds," which he explains are known as bonduc nut (the febrifuge seed of *Cæsalpinia Bonducella*, or nicker tree).

More recently, Mr. O. Weynton (682), calls attention to the occurrence of *Croton Tiglium* in all parts of the fertile and wealthy province of Assam, especially in the dry districts. He states that the demand for the drug is small, and that the plant has a tendency to spread. Hence efforts are being made to restrict the growth, and keep it within certain bounds.

The ancient Hindu physicians were not acquainted with the drug, which seems to have originated in China, from whence, at an early day, the seeds were also introduced into Persia (where they are now called *dand*), by way of the caravan routes of Central Asia. Subsequently the Arabs derived their knowledge of the seeds from the Persians, their name, hab-el-kathai (*Cathay seeds*), being in turn suggestive of the Chinese origin (209). Some of the vernacular Indian names, according to Dymock, (208), seem to indicate that the plant reached India through the Himalayan province of Nepal (209).

Croton was imported into Europe by the Dutch during

Digitized by Google

the sixteenth century. The first account of the plant in European literature, however, must be credited to the Portuguese physician Christoval Acosta, who in 1578 described the wood as *lignum pavanæ* (or *L. Panavæ* or *L. moluccense*), and the seeds as *pini nuclei moluccani* (3). The prominent writings of Rheede, (1678), who gives the Malayan name *cadel avanacu* (547), Ray, (1688), and others, later gave the drug due consideration, while C. Bauhinus, (1671), differentiated between several synonyms of the seeds and woods that were then in use. To Caspar Commelyn (1667-1731) is attributed the first use of the name *cataputiæ minores* for the seeds, while the well-known synonym *grana tiglii* is also stated to have been originated in his time. And yet that author's work on the *Flora Malabarica* (1696), does not record the first term, although the name *grana tiglii* is therein accredited to Samuel Dale's *Pharmacologia*, (the first edition of which appeared in 1693). (179).

As regards the use of the oil derived from the seeds, E. von Hirschheydt, in the exhaustive historical introduction to his dissertation (318a), mentions that Peter Borellus, a French physician (1620-1689), in 1657 lauds the cathartic virtues of the oil, which in as small an amount as two drops caused purging, even when merely rubbed into the skin. Similar mention of its virtues is made by Rumphius (*Herbarium Amboinense*, 1750). Geoffroy (260), in his *Materia Medica*, (1756), reports that the natives of India use the oil to make what they call the royal purging apple (*poma cathartica*), the mere odor of which was asserted to purge persons of delicate constitutions. The directions for making this potent "apple" are as follows:

Digitized by Google

"Macerate an orange or lemon in oil of tilli (croton oil) for one month. Remove it, hold to the nostrils and inhale the breath; soon afterwards the bowels will move."

About 1750, Cohausen, according to several authorities, employed croton oil with success in cases of tænia.

Although during the 17th and 18th centuries the remedy had been frequently used, it seems that toward the end of the 18th century it fell into oblivion, probably on account of its energetic action. However, its use was revived when in 1812 several English physicians, among them Drs. White and Marshall, observed the action of the seed in medical practice in India, and brought the drug again to the notice of the profession in Europe. (209). Ainslie in 1813, and Conwell in 1819, by their publications, gave it further prominence. In connection with its reintroduction, we note the interesting fact that a Mr. Short then brought the drug to Europe, and was so fortunate as to secure the right (license) to its exclusive sale in England. That it at once became an important drug is shown by the attention then given it in medical literature. An extensive list of references to the literature of *Croton Tiglium*, covering the period from 1820 to 1835 alone, may be found in Hirschheydt's dissertation (318a). According to this authority, (1890), the seeds and the oil are seldom used in Europe, other than in veterinary practice, as he states, on account of the uncontrollable influence exerted by the presence of the powerfully toxic *ricin* (an albuminoid body), in the oil.[1]

As already stated, the genus croton was established

[1] In the opinion of the historian, this valuable cathartic is discredited because *alone* it is in even moderate doses very aggressive. With proper condiments, and other laxative associates, a different reputation might ensue.

Digitized by Google

by Linnæus in 1737, the name being adopted from the Greek synonym for *Ricinus communis*, the seeds of which, as also those of *Croton Tiglium*, have a resemblance to a tick (dog-tick, κροτών in Greek). As to the origin of the term tiglium, some authorities ascribe it to the Moluccan island of Tilho, while others (696) believe it to be derived from the Greek word *tilos*, meaning diarrhea. The botanical and vernacular synonyms antedating the name given by Linnæus are numerous, and are generally carried by the older botanico-medical works, e. g., by Dale, (179), Bauhinus (47), and others. The post-Linnæan synonyms recorded in the *Index Kewensis* are rarely if ever seen in pharmaceutical print, and may well be reproduced, as follows:

1. *C. acutus*, Thunberg, 1784.
2. *C. jamalgota*, Hamilton, 1825.
3. *C. pavana*, Hamilton, 1825.
4. *Kurkas Tiglium*, Rafinesque (*Sylva Tellur.*), 1838.
5. *Halecus verus*, Raf., 1838.
6. *Tiglium officinale*, Klotzsch, 1843.
7. *Croton muricatus*, Blanco, 1845.
8. *Anisophyllum acutifolium*, Bouv., 1860–61.

CUBEBA (Cubeb)

Mentioned in every edition of the *U. S. P.* The later volumes, beginning with 1870, limit the drug to the *unripe* fruit.

Cubebs, *Piper Cubeba*, the berry of a shrub indigenous to Java, Southern Borneo, and Sumatra, was originally introduced to Europe as a spice. Masudi (413) in the 10th century refers to cubebs as a product of Java. Edrisi (221), 1153, mentions the berries as among the imports of Aden. That they were known in Europe as early as the 11th century, is evident from the writings

Digitized by Google

of Constantius Africanus (165), of Salerno, while Abbatissa Hildegarde, (316), of Germany, mentions them in the 13th century, at which time they had become an article of European trade. They were sold in England in 1284, and at that time, or thereabout, were known to European countries generally. The price in 1596 was equal to that of opium or of amber. Cubeb berries were introduced into medicine by the Arabs of the Middle Ages.[1]

The following interesting article is recorded in Flückiger's *Pharmacographia*, pp. 584-5:

"Cubebs are mentioned as a production of Java (*'grand isle de Jawa'*) by Marco Polo; and by Odoric, an Italian friar, who visited the island about forty years later. In the 13th century the drug was an article of European trade, and would appear to have already been regularly imported into London. Duty was levied upon them as *Cubebas silvestres* at Barcelona in 1271. They are mentioned about this period as sold in the fairs of Champagne in France, the price being 4 *sous* per lb. They were also sold in England: in accounts under date 1284 they are encountered with almonds, saffron, raisins, white pepper, grains (of paradise), mace, galangal, and gingerbread, and entered as costing 2s. per lb. In 1285, 2s. 6d. to 3s. per lb; while in 1307, 1 lb. purchased for the King's Wardrobe cost 9s.

"From the journal of expenses of John, king of France, while in England during 1359-60, it is evident that cubebs were in frequent use as a spice. Among those who could command such luxuries they were eaten in powder with meat, or they were candied whole. A patent

[1] We fail to find cubeb mentioned by Burton. Possibly it was given a position under another name. His *Thousand Nights and a Night*, so prolific in natural history notes, lacks an index of drugs and plants. This is to be regretted.

Digitized by Google

of pontage granted in 1305 by Edward I, to aid in repairing and sustaining the Bridge of London, and authorizing toll on various articles, mentions among groceries and spices, cubebs as liable to impost. Cubebs occur in the German lists of medicines of Frankfort and Nördlingen, about 1450 and 1480; they are also mentioned in the *Confectbuch* of Hans Folcz of Nuremberg, dating about 1480.

"It can not, however, be said that cubebs were a common spice, at all comparable with pepper or ginger, or even in such frequent use as grains of paradise or galangal. Garcia de Orta, (1563), speaks of them as but seldom used in Europe; yet they are named by Saladinus as necessary to be kept in every *apotheca*. In a list of drugs to be sold in the apothecaries' shops of the city of Ulm, A. D. 1596, cubebs are mentioned as *Fructus carpesiorum vel cubebarum*, the price for half an ounce being quoted as 8 *kreutzers*, the same as that of opium, best manna, and amber, while black and white pepper are priced at 2 *kreutzers*."

CUSSO, COUSSO, KOUSSO (Kousso)

Introduced as *Brayera* in Secondary List of 1860. It retained this name in the editions of 1870 and 1880. It was official as Cusso in the editions of 1890 and 1900, but was neglected altogether in 1910.

The cousso tree (*Hagenia abyssinica*) is native to Abyssinia, where it is generally planted about the villages on the high tablelands, from 3,000 to 8,000 feet above the sea level. Bruce (105) observed its uses, 1768–1773, during his expedition to discover the sources of the Nile, and Willdenow (385), 1799, described it under the name *Hagenia*. Its use as a vermifuge was derived from Abyssinian domestic practice,

Digitized by Google

the decoction being used for this purpose. In early European record, an extraordinarily high price was asked for this substance. It was introduced to Europe in 1850 by a Frenchman, who demanded in the neighborhood of $9 *per ounce*. This led to its importation in quantities, when the value soon fell to a normal standard. In the opinion of this writer, the decoction should be employed, not an alcoholic preparation. This applies also to pumpkin as well as many other drugs.

CYPRIPEDIUM (Lady's Slipper)

Introduced into the *U. S. P.* in 1860, but in the Secondary List, holding the same position in 1870. In the editions of 1880, 1890 and 1900 it was official, but was dropped in 1910.

Lady's slipper (*Cypripedium pubescens*) is found in several varieties throughout the United States, where it is indigenous to rich woods and meadows. It has been valued as a domestic remedy and was once a home favorite in the form of a decoction for nervous conditions of women and children. It was thus utilized by the early settlers as a substitute for valerian, which gave it the name *American valerian*. Creeping thus into domestic therapeutic use, it naturally received the care and attention of the "Indian doctors," and came gradually to the attention of the medical profession. To give its American record, complete, would cite all the domestic writers on American medicine of the 19th century, as well as such authorities as King (356), Wood and Bache (698), etc.

Digitized by Google

DIGITALIS (Foxglove)

Including 1820, every edition of the *U. S. P.* mentions Digitalis leaves. The New York edition of 1830 names "leaves and seeds." Beginning with 1860, the drug is limited to *second year* growth, this restriction being removed in 1910.

Digitalis purpurea occurs throughout the greater part of Europe, being, however, generally absent from limestone districts. It was used in domestic medicine in early days, and by the Welsh as an external medicine. (507). Fuchs (252) and Tragus (650), 1542, pictured the plant, but remarked that it was a violent medicine. Parkinson (492) commended it in 1640, and it was investigated in 1776–9 by Withering (693), through whose efforts it was introduced into licensed medicine. Digitalis was originally employed as a remedy in fevers, in which direction it is no longer used. In 1799, J. Ferriar (233), of Manchester, England, contributed a treatise concerning the medicinal uses of digitalis, which was also described by Withering, Bosch (89), Moore (450), and other authors of that period. At present digitalis is by some standardized by its physiological qualities when injected into the veins of lower animals, the United States Government having issued a bulletin on this subject. (332a). Discussions of this phase of the problem are, however, out of place in this history.[1]

Digitalis frequents silicious lands, but does not thrive in limestone soil. It is widely cultivated, not only for its medicinal properties, but also as a garden flower, being well known under the common term *Foxglove*, a name ascribed to it both from its resemblance to an ancient musical instrument known as *Foxes-Glew*,

[1] Necessity sometimes demands that a prominent phase of drug action be recorded. Usually, however, even this can be avoided.

Digitized by Google

and from its fancied resemblance to a gloved finger. Tragus (650) was the "first systematic author who noticed it, and from him it received its name, *Digitalis* (from *digitus*, finger), in allusion to the German name Fingerhut, signifying a finger-stall, the blossoms resembling the finger of a glove."—*Withering*. The home of the most prized digitalis is England.

Digitalis is easily grown in lands and countries fitted to its culture, reproducing from self-sown seed. Motherby, 1775, (451b), states that "it grows only in gravelly beds," a statement that has been carried through subsequent literature, but is not fact, although we accept that the plant "prefers" such soil. In limestone lands digitalis failed, under our personal observation, to respond satisfactorily to cultivation. Limestone sections of Kentucky, although very fertile otherwise, and producing luxuriant crops of corn and heavy tobacco, failed utterly with digitalis, although an abundance of seed of unquestioned fertility was employed. In gardens, however, in limestone sections of both Kentucky and Ohio, the transplanted plants thrive for two seasons, but the self-sown seeds therefrom fail to maintain the crop. In New York State, in the valley of the Honeoye River, digitalis planted in 1820 in a flower garden on the homestead of the Webster family, (the home of the writer's mother), at the present date, (recorded in 1912), continues as a great wild bed, self-sown from year to year. The late Professor M. I. Wilbert, of Washington, D. C., stated to us that under favorable circumstances, digitalis may become a perennial. Possibly this is a factor in its luxuriant growth in the locality named. In some parts of the State of Oregon, digitalis has escaped from culti-

Digitized by Google

vation and become a thick roadside plant, growing luxuriantly near Cloverdale, and in such abundance as to have led to its consideration as a commercial crop. To Dr. Walter F. Brown, of that city, we are indebted for nice specimens of the leaf, and photographs showing the flower-spikes over nine feet high. He writes as follows, (1912):

"1. As near as I can find, digitalis has been growing here for twenty years. It was confined to a few spots for several years, but it is now found all over the southern half of the county.

"2. It is supposed to have been brought here by pioneers, and cultivated for its flowers.

"3. The dairymen claim that some cows will eat it in early spring, when the leaves are tender and other forage is scarce. It has no noticeable effect on the animals that eat it, but they eat very little of it.

"4. I have used the infusion and the tincture for about fifteen years, and of late years I have used digitalin to some extent.

"5. People in this locality make no use of the plant, looking upon it as a despicable weed that takes their hillside pastures."

Other than for the high price of labor in this country, there is no reason why digitalis should not be American cultivated, and in localities suited to its growth, such as Oregon, produce an abundance sufficient to supply all our needs.

The leaf of the second year's growth of digitalis is generally directed to be used, but in our opinion this limitation to the second year's crop is ill-advised and unnecessary. The mature leaves of either the first or the second year's crop are superior to immature or

Digitized by Google

over-ripe leaves, of any year. The standard of excellence should be the fully-matured, air-dried leaf, regardless of the age of the plant, and we question if collectors anywhere discriminate concerning the age of the plant. In this connection we would state that, originally, both the root and the leaf of digitalis were employed in medicine. The root, however, is exceedingly variable in structure, that of the first year's growth being insignificant and sappy, whilst the root of the second year's growth is larger and heavier, and more pronounced in quality. Inasmuch as the leaf possesses fully the qualities of the drug, and is more easily collected, it naturally displaced the root in medicine. The preference once given to the second year's growth of the *root*, created both the confusion and the prejudice whereby the *leaf* of the first year was finally ostracized, even in authoritative literature. Thus both Pharmacopeias and standard works on materia medica were illogically led to exclude much excellent digitalis material. In searching for data in this direction, we find that Withering, Physician to the General Hospital at Birmingham, in 1785, writes as follows, in his "*An Account of the Foxglove*" (693):

"My truly valuable and respectable friend, Dr. Ash, informed me that Dr. Cawley, then principal of Brazen Nose College, Oxford, had been cured of a Hydrops Pectoris by an *empirical exhibition of the root* of the Foxglove, after some of the first physicians of the age had declared they could do no more for him. I was now determined to pursue my former idea more vigorously than before, but was too well aware of the uncertainty which must attend on the exhibition of the *root* of a

Digitized by Google

biennial plant, and therefore continued to use the *leaves.*"

Withering is also explicit in distinguishing between the qualities of the leaves gathered at *different seasons of the year*, but he does not limit the drug to the second year's growth. He states that at different seasons of the year the quality varies greatly, which is true of all herbs. He therefore suggests that the leaves employed should be those of a *prime quality*, gathered *when the plant is in flower*, (which is in the second year's growth), but makes no other reference whatever to either the first or the second year's crop. He says:

"The leaves I had found to vary much as to dose, at different seasons of the year; but I expected, if gathered always in one condition of the plant, viz., when it was in flowering state, and carefully dried, that the dose might be ascertained as exactly as that of any other medicine."

During the past fifteen years the writer of these historical notes has cultivated more or less digitalis, but, as has been said, he has failed to discover any advantage that the second year's crop possesses over the mature leaf of the first year, other than that there is a greater number of mature leaves the second year, the crop being heavier than the first year. In the original European experimentation, the seed and flowers were also employed in therapy, but soon passed into disuse. Withering employed the leaf texture, after removing the ribs and fibers.[1]

[1] For detailed experiments on both cultivation and assays of Digitalis see researches of Haskell, Miller, Walters, Eckler & Baker. "*The Lilly Scientific Bulletins*," Nos. 1 2, 4 & 5.

Digitized by Google

ELATERIUM (ELATERIUM)

Elaterium was official in all the early editions of the *Pharmacopeia*. In 1880 it was displaced by its product, *Elaterin* (a neutral principle extracted from elaterium), which became official in this and succeeding editions of the *U. S. P.*, through 1910.

Elaterium is the dried juice of the fruit of *Ecballium Elaterium*, common throughout the Mediterranean regions, from Portugal to Southern Russia and Persia, as well as through Central Europe. The method of preparing elaterium, as described by Dioscorides (194), is practically that of the present day. The drug is also mentioned by Theophrastus (633). Elaterium is a powerful hydragogue cathartic, paralleling *Croton Tiglium* in its vicious action, and has been empirically known from the earliest times to the natives of the countries it inhabits. Clutterbuck (154), (1819, *London Medical Repository*, XII, pp. 1–9), recommends a process of obtaining elaterium in irregular cake-like fragments. This is now the form in which it is employed in medicine; hence the common term, "Clutterbuck's elaterium."

ERGOTA (Ergot)

Official in all editions of the *U. S. P.* It appears in the Secondary List in 1820 and 1828 under the name "*Secale cornutum, Secale cereale*," with the description "Spurred Rye. Called *Ergot*." The edition of 1830 promotes it to the Primary List, but retains the name *Secale*. The edition of 1840 first makes the name *Ergota* the primary name, with the description, "The diseased seeds of *Secale cereale*." This name and description are followed by the editions of 1850 and 1860. The edition of 1870 changes the description to "The sclerotium of *Claviceps purpurea*," which is retained by all succeeding editions, including that of 1910.

This drug, from the earliest period, has been known as a disturber of flour, it having been long since observed that flour made of rye containing ergot gave rise to the disease now known as ergotism. When we consider

Digitized by Google

that many of the malignant epidemics and frightful pestilences recorded in the history of medieval Europe, including an epidemic occurring as late as 1816, were ascribed to spurred rye, it can be seen that such old terms as "convulsivus malignus" and "morbus spasmodicus," once applied to the (accepted) ergot disease, were well chosen. Not till 1838, however, was the nature of ergot authoritatively determined by Quekett (529) in his paper read before the Linnæan Society, titled, "*Observations on the Anatomical and Physiological Nature of Ergot in Certain Grasses.*" Before that date, although recognized as a fungus, the stage known as ergot was considered a distinct species.

As with other important natural drugs, so with ergot. It is initially a gift of domestic medicine, and was first mentioned by Adam Lonicer (394), Frankfort, Germany, who (1565) ascribed to it obstetric virtues, on the authority of women who considered it of "remarkable and certain efficacy." The English botanist Ray (536) alludes to its medicinal properties (1693); a Dutch physician, Rathlaw, employed it in 1747; Desgranges, of Lyons, praised it in 1777; while Dr. John Stearns, of Waterford, N. Y., (611a), who introduced ergot to American medicine, 1807, under the name "Pulvis parturiens," highly commended it in a paper contributed to the *Medical Repository* (418b), which gave ergot a place that, supported by other testimony, pushed the drug into prominence. Ergot, it may be repeated, is a gift of home obstetric practice, established over three centuries ago by the German midwives.

The chemistry of ergot was the subject of a paper by Dr. A. R. L. Dohme, of Sharp & Dohme, con-

Digitized by Google

tributed to the *Proc. Amer. Pharm. Ass'n.*, 1895, pp. 262-265. As might be expected by any person conversant with the record of this perplexing drug, the author was not satisfied with the results, closing his paper with the frank sentence: "Should subsequent work show that Keller's Cornutine is the active principle of ergot, and that his method extracts all of this substance from the drug, then the above results may become of value; as it is, they can merely be regarded as indications, and possess interest rather than value."

The problem of the ergot constituents or products of manipulation lies outside the field of our history of crude drugs.

ERIODICTYON ("Yerba Santa")

Introduced into *U. S. P.*, 1890. Official in the two following editions.

This drug, *Eriodictyon californicum* (*Eriodictyon glutinosum*), long employed by the Indians of California, was introduced to medical print in 1875 by Dr. J. H. Bundy (111a), of Colusa, California, his original article appearing in the *Eclectic Medical Journal* of that year, p. 453. Under the name "*Yerba Santa*," Dr. Bundy records as follows:

"This is a remedy that, to my knowledge, has never been placed before the medical profession with any certainty or knowledge as to its therapeutic action or power, nor do but few in any part of the country know even of the existence of such a plant. I have been carefully testing it for the past six months or more, to find out if possible its specific or particular action upon the human economy, and upon what particular part or parts it has its influence. At last I have arrived at

Digitized by Google

conclusions so definite in this particular, and so satisfied and pleased am I with the remedy, that I can not refrain from making public the knowledge of a remedy so certain and so positive in its action, and one so much desired by the medical profession. The term 'Yerba Santa' is one given by the Spanish, which signifies 'saint herb,' or 'holy herb.' It is a native of California, and is found principally in the East Range Mountains."

In February, 1876, Dr. J. M. Scudder received specimens of the plant from Dr. Bundy, which were identified by Mr. C. G. Lloyd as *Eriodictyon glutinosum*. This name was announced in the March number of the *Eclectic Medical Journal*, 1876.

Pharmaceutical preparations of this drug were first presented to the American medical profession by Parke, Davis & Company, of Detroit, in *New Preparations* (467), 1877–1878. Independently of others, (May 18, 1875), Professor John M. Maisch (401a), of Philadelphia, had described the leaves of the plant, presenting specimens to the Philadelphia College of Pharmacy, and stating that the plant, known in California as *Mountain Balm*, had an extremely bitter taste. (*Amer. Journ. of Pharm.*, June, 1875, p. 279). In February, 1876, Professor Maisch corrected his statement "that the leaves had a bitter taste," ascribing to them their characteristic aromatic flavor. In 1876, the February number of *The Pharmacist*, Chicago, was headed by a paper from Henry S. Wellcome, Ph.G., (677), in which appeared the first descriptive article in pharmaceutical print concerning this plant, and its connection with medicine and pharmacy. This article, illustrated with a full page frontispiece, described the plant, gave re-

Digitized by Google

search examinations of it, and, as follows, credits Dr. Bundy with having furnished the specimens:

"Dr. J. H. Bundy, of California, to whom I am indebted for some very perfect and handsome specimens, including one entire shrub, has been conducting a series of investigations, with a view of determining its precise physiological action upon the functions."

It is evident that Dr. Bundy (111a) sent specimens of the plant to all the authorities concerned in its introduction, but that the first description of its uses, under the common name "Yerba Santa," was written by him for *The Eclectic Medical Journal*, Cincinnati, 1875. Let us in this connection refer to our study of *Rhamnus purshiana*, or *"Cascara sagrada,"* a drug introduced about the time of the discussion of *Eriodictyon*.

EUCALYPTUS (Eucalyptus, Blue Gum Leaves)

First mentioned in the *U. S. P.* in 1880. Official in each edition thereafter; including that of 1910.

Eucalyptus globulus, and other species of eucalyptus, are indigenous to Australia, where the leaves are employed by the natives as a remedy for intermittent fever. It was thus introduced to Europeans towards the middle of the 19th century. Possibly its employment by the crew of the ship *La Favorita*, who in the vicinity of Botany Bay were nearly decimated by fever, from which they recovered through the use of an infusion of the leaves of eucalyptus, first, through the efforts of Dr. Eydoux and M. de Salvy, gave the drug conspicuity. Dr. Ramel, of Valencia, however, has the credit of introducing the drug to the Academy of Medicine, 1866, thus bringing it to the attention of the medical profession, by whom it is now used in extract

Digitized by Google

form, in other directions than that for which it was originally commended. The distilled oil of eucalyptus has now an extended reputation and use. The date of the first use of eucalyptus by the natives of Australia is unknown.

EUONYMUS (Wahoo)

Introduced, in the Secondary List, into the *U. S. P.* in 1860, retaining this position in the edition of 1870. It was official in the editions of 1880, 1890 and 1900, but was dropped from the 1910 edition.

Euonymus atropurpureus and *Euonymus americanus* are collected indiscriminately, both varieties being known by the common name "*Wahoo.*" The bark of the root is the part used. In the form of a decoction, this remedy was originally a favorite in domestic medicine, and was introduced from thence to the more systematic medical profession, as were other American drugs of like nature. It occupied a place in all the early domestic works on medicine, and seems to be alike credited to the American Indians, and to the early settlers. In early botanic as well as Eclectic medication, "wahoo" has been a favorite since the days of Dr. Beach. Under the names "nine barks" and "seven barks" it has a domestic record, that has been transferred to various proprietary remedies using these titles. From euonymus was derived a so-called Eclectic resinoid or "concentrate," that during the craze for "proximate principles" had but a moderate use. Twenty-five years later, without apparent reason, came from England an abrupt demand for the drug, that made euonymus more conspicuous than ever before. From an article contributed by the writer in 1909, let us extract as follows:

"THE ENGLISH EUONYMIN CRAZE.—A quarter of a

Digitized by Google

century after the resinoids of America received their deathblow at the hands of the Eclectics, a peculiar craze for *Euonymin* struck England. The American manufacturers' lists quote two colors of the drug, one green and the other brown. These two forms came into English demand, and owing largely to their exploitation by the celebrated Dr. Richardson, of London, so great was the 'Euonymin' craze in that country, that within a brief period American resinoid makers were overwhelmed with orders for the drug. The root, root-bark, shrub, and the shrub-bark supplies of the crude drug employed for their manipulation became exhausted, whilst the price of all forms of the crude drug doubled and trebled. We know of single orders from London for one thousand pounds, each color of Euonymin, quick delivery. From 1885 to 1890 the English Euonymin craze was at its height, and during those years the English pharmaceutical and medical press teemed with articles concerning the wonderful remedy! The various Euonymins were examined for ash, and the old question of inorganic admixture was naturally revived, especially with the green-colored drug, where aluminum hydroxide is likely to be employed to precipitate the chlorophyl-bearing structures and associated materials from the evaporated alcohol extract, said hydroxide contaminating the product. It was even reported that one lot of Euonymin contained much barium carbonate, a statement difficult to accept!"

As abruptly as it began did the English concentration fad terminate, leaving but a few energetic resinoids, such as King's Resin of Podophyllum (representative of the class), still used in England, as it is both used as well as abused today in all parts of the civilized world,

Digitized by Google

as shown in current pharmaceutical and therapeutical literature.

EUPATORIUM

(Eupatorium, Thoroughwort, "Boneset.")

Rejected from 1910 *U. S. P.* Official in every other edition, from 1820.

Eupatorium perfoliatum, boneset or thoroughwort, is indigenous to the temperate regions of the Eastern United States. In the form of an infusion or tea, it was very popular with the settlers, by whom it was employed "in every well-regulated household." As a bitter tonic, its uses became known to the early members of the American medical profession, its praises being handed therefrom to physicians of the present day. In this connection it may be stated that over one hundred years before there was in print an American materia medica, eupatorium was a favorite remedy in the practice of American physicians. The first work in covers touching American medicinal plants,—Schöpf, 1785 (582),—gave it a setting. This was followed (1789) by Professor B. S. Barton (43), of the University of Pennsylvania, in his *Collections of American Remedial Agents*. Medical authorities such as Thacher, Bigelow, Chapman, Rafinesque and Zollickoffer pronounced the highest encomiums on the value of eupatorium. Its principal field of usefulness was in colds and influenza, Dr. Anderson, of New York, issuing in 1814 a special treatise on the subject of this drug and its uses. So good an authority as Dr. Hosack testified to its value in intermittents, but its chief application was as an influenza remedy. Let us quote from the celebrated botanical explorer, Pursh (528), concerning its early record in that direction:

Digitized by Google

"The whole plant is exceedingly bitter, and has been used for ages past by the natives and inhabitants in intermittent fevers. . . . I have stated a case of its efficacy in those diseases in a letter to William Royston, Esq., who inserted it in the *Medical and Physical Journal*, in which I stated the benefits derived from this plant, by myself and others during my stay in the neighborhood of Lake Ontario, when both the influenza and lake fever (similar to the yellow fever) were raging among the inhabitants."—Pursh's *Flora Americanæ Septentrionalis*, 1914.

— FICUS (Fig)

Official in every edition of the *U. S. P.*, excepting the 1910 and the New York edition of 1830. (It appears in the Philadelphia edition of 1830).

The fig tree, *Ficus Carica*, is native to Asia Minor and Syria, extending into Africa and Oriental countries, the Mediterranean islands, and elsewhere. It is now cultivated in the temperate countries of the entire world. The fig tree and its leaves are repeatedly mentioned in the Scriptures, where they are symbolical of peace and plenty. Charlemagne, A. D. 812, ordered its cultivation in Central Europe, and in the reign of Henry VIII, fig trees, still standing in the garden of Lambeth Palace, were brought to England, though the fig was unquestionably cultivated in England before that date. The fig has been used from all times as a food and as a confection, and it is repeatedly mentioned in the *Arabian Nights*. From the *Pharmacographia* of Flückiger and Hanbury, we extract as follows:

"Figs were a valued article of food among the ancient Hebrews and Greeks, as they are to the present day in the warmer countries bordering the Mediterranean.

Digitized by Google

In the time of Pliny, many varieties were in cultivation. The Latin word *Carica* was first used to designate the dried fig of Caria, a strip of country in Asia Minor opposite Rhodes, an esteemed variety of the fruit corresponding to the Smyrna fig of modern times.

"In a diploma granted by Chilperic II, king of the Franks, to the monastery of Corbie, A. D. 716, mention is made of '*Karigas*' in connection with dates, almonds and olives, by which we think dried figs (*Caricæ*) were intended. Dried figs were a regular article of trade during the middle ages, from the southern to the northern parts of Europe. In 1380 the citizens of Bruges, in regulating the duties which the 'Lombards,' i. e. Italians, had to pay for their imports, quoted also figs from Cyprus and from Marbella, a place south-west of Malaga.

"In England, the average price between A. D. 1264 and 1398 was about 1¾d per lb., raisins and currants being 2¾d."

The tri-lobed leaf of ficus is synonymous with primitive religions, and it has occupied a more or less conspicuous place in symbolic worship, from the earliest date. Let us quote:

"Near Cairo, at a fountain wherein the Virgin Mary washed her infant's clothes, a lamp was, three centuries ago, kept burning in her honor in the hollow of an old *fig tree*, which had served them as a place of shelter, according to the 'Itinerario de Antonio Tenreio.'—From *Cultus Arborum*, privately printed, author unnamed.

"When thou has turned yonder lane, goatherd, where the oak trees are, thou wilt find an image of a *fig tree* wood, newly carven; three legged it is, the bark still

Digitized by Google

covers it, and it is earless withal. A right holy precinct runs round it, and a ceaseless stream that falleth from the rocks on every side."—Theocritus, *Epigram IV.*

FŒNICULUM (Fennel, Fennel Seed)

Official in every edition of the *U. S. P.*, excepting that of New York, 1830.

Fennel, *Fœniculum vulgare*, is indigenous from the Caspian Sea to the Greek peninsula and other Mediterranean countries, growing wild over a large part of Southern Europe, especially in the vicinity of the sea. It is also cultivated in favorable localities, as in Saxony, France and Italy. Charlemagne encouraged its cultivation. Its employment in Northern Europe has been from all time, as is indicated by the fact that Anglo-Saxon domestic medical recipes dating from at least the 11th century give it a place. The use of the seeds in domestic medication in the form of infusion, as well as its employment in bread-making, is too well established to need more than a mention. The various varieties of fennel are fully described in all works on pharmacy. To attempt to give references to its literature would be to cite every work on medicine and botany from the earliest time to the present.

FRANGULA (Frangula, Buckthorn)

Introduced in 1880. Official in following editions, including 1910. See also *Rhamnus-Purshiana.*

Buckthorn, *Rhamnus Frangula*, grows in wet places throughout Europe, Siberian Asia, and the Northern African Coast. From a very early date it has been known as a cathartic as well as a coloring agent. A decoction of the bark has been in domestic use both as a

Digitized by Google

dye for cotton, wool, and silk fabrics, and as a cathartic, in which latter direction it is very effective. No written professional record antedates its domestic use, and perhaps as a "rheumatic remedy," it has in certain forms of that ailment no domestic superior. This drug has been practically displaced in America by *Rhamnus Purshiana.*

GALLA (Nutgall)

Official in every issue of the *U. S. P.*, from 1820 to 1910.

Oak galls, *Quercus infectoria*, are mentioned by Theophrastus (633) and other ancient writers, and were prescribed by Alexander Trallianus (11) as a remedy in diarrhea. They are derived from varieties of the oak, Smyrna being one of the export points. In that city we have seen them in large quantities, in process of sorting for exportation. In our study of Oriental products in Smyrna, in 1906, we were not only much interested in the process of sorting nutgalls, but were impressed with the enormous amounts of *acorn caps* then exported to Europe for tanning purposes. As an astringent, galls have long been employed in decoction in domestic practice in the countries from which they are obtained as excrescences on the oak. Flückiger and Hanbury (240) mention nutgalls as follows:

"The earliest accurate descriptions and figures of the oak and the insect producing the galls are due to Olivier. Pliny mentions the interesting fact that paper saturated with an infusion of galls may be used as a test for discovering sulphate of iron, when added as an adulteration to the more costly verdegris; this, according to Kopp, is the earliest instance of the scientific application of a chemical reaction. For tanning and dyeing,

Digitized by Google

galls have been used from the earliest times; during the Middle Ages, however, they were not precisely an article of great importance, being then, no doubt, for a large part replaced by sumach.

"Nutgalls have long been an object of commerce between Western Asia and China. Barbosa, in his *Description of the East Indies*, written in 1514, calls them *Magican*, and says they are brought from the Levant to Cambay by way of Mekka, and that they are worth a great deal in China and Java. From the statements of Porter Smith (605a), we learn that they are still prized by the Chinese."

GAMBIR (Gambir)

Introduced in 1900, to replace *Catechu*, official in all *U. S. P's.* until that date.

Gambir (or gambier), *Ourouparia gambir*, is a shrub native to the countries bordering the Straits of Malacca, being found also in Ceylon and India. The dried juice of an Indian tree (*Acacia catechu* and *Acacia suma*), is often confused with gambir, and its extract, (catechu or cutch), is only too often substituted therefor. Gambir has been obtained from the Orient from the beginning of historical records, and in those countries, mixed with other substances, seems ever to have been used as an astringent in domestic medicine. Both gambir and catechu, as these products are often called, indifferently, have ever been articles of export to China, Arabia and Persia, but were not brought into Europe until the 17th century. They are similarly astringent, and although the *U. S. P.*, 1900 edition, drops the word catechu, it is questionable whether, in commerce, a close distinction is drawn in extractive products. The history of Gam-

Digitized by Google

bir, as related by Flückiger, is of much interest. We present it, as follows:

"Gambier is one of the substances to which the name of *Catechu* or *Terra Japonica* is often applied; the other is *Cutch*. By druggists and pharmaceutists the two articles are frequently confounded, but in the great world of commerce they are reckoned as quite distinct. In many price-currents and trade-lists *Catechu* is not found under that name, but appears only under the terms *Cutch* and *Gambier*.

"Crawfurd asserts that gambier has been exported from time immemorial to Java from the Malacca Straits. This statement appears highly questionable. Rumphius, who resided in Amboyna during the second half of the 17th century, was a merchant, consul and naturalist; and in these capacities he became thoroughly conversant with the products of the Malay Archipelago and adjacent regions, as the six folio volumes of his *Herbarium Amboinense*, illustrated by 587 plates, amply prove.

"Among other plants, he figures *Uncaria Gambier*, which he terms *Funis uncatus*, and states to exist under two varieties, the one with broad, and the other with narrow leaves. The first form, he says, is called in Malay *Daun Gatta Gambir*, on account of the bitter taste of its leaves, which is perceptible in the lozenges (*trochisci*) called *Gatta Gambir*, so much so that one might suppose they were made from these leaves, which, however, is not the case. He further asserts that the leaves have a detergent, drying quality by reason of their bitterness, which is nevertheless not intense, but quite bearable in the mouth; that they are masticated instead of *Pinang* (Betel nut) with *Siri* (leaf of

Digitized by Google

Piper Betle) and lime; that the people of Java and Bali plant the first variety near their houses for the sake of its fragrant flowers; but though they chew its leaves instead of *Pinang*, it must not be supposed that it is this plant from which the lozenges *Gatta* are compounded, for that indeed is quite different.

"Thus, if we may credit Rumphius, it would seem that the important manufacture of gambier had no existence at the commencement of the last century."

GAULTHERIA (THE OIL)[1]

GAULTHERIA (Wintergreen, Partridge Berry)

Gaultheria (*leaves*). Mentioned in Secondary List of 1820, same in 1828. Official in 1830, both New York and Philadelphia editions, and in all later editions until 1890, when Gaultheria *Leaves* were dropped, and Oil of Gaultheria, (official in *all* editions, from 1820 on), remained alone. In 1910 the name "Gaultheria" was dropped, being replaced by "*Methyl Salicylate.*"

The first record of the therapeutical use of oil of gaultheria, as is often the case with valuable medicines, is to be found in empirical medicine. A proprietary remedy, very popular about the beginning of this century under the name "Panacea of Swaim," or "Swaim's Panacea," introduced this drug.

Gaultheria gave added impetus to "*Compound Syrup of Sarsaparilla,*" which became so popular as to force itself on the attention of the profession. The Sarsaparilla Compound of the name of "Sirup Rob Anti-Syphilitica" was closely associated with Swaim's Panacea, and Ellis, 1843, after giving the formula of "Sirup Rob Antisyphilitica" in his *Formulary*, p. 67, says: "The above preparation has been asserted, by the New York Medical Society, to be nearly identical with the noted Panacea of Swaim."

[1] This article largely parallels the study of Gaultheria by the author printed in the *Pharmaceutical Review*, Vol. 16, No. 5.

Digitized by Google

That oil of gaultheria was a constituent of Swaim's remedy, and that it was brought into conspicuity therein, may also be seen from the analysis of Swaim's Panacea (by Chilton), recorded in the *Am. Jour. Med. Sciences*, 1829, p. 542. The following reprint from an anonymous writer in the *American Journal of Pharmacy*, 1831, establishes the subject more clearly in that it gives a very fair description of oil of gaultheria, as well as making a statement to the effect that it is the same as sweet birch oil, and showing further that many different plants yield the same oil:

"Oil of *Gaultheria procumbens*:—This is the heaviest oil of which we have any knowledge, for I have found it to be 1.17. This furnishes us with an easy mode of testing its purity. The wonderful success of Swaim's Panacea has brought this oil into great vogue with all venders of Catholicons, Panaceas, and Syrups of Sarsaparilla.

"It appears to be a vegetable principle secreted in plants very widely separated by their natural affinities. The *Betula lenta* or Sweet Birch secretes it in its bark; the *Polygala paucifolia* in its roots; the *Spiræa Ulmaria*, the *Spiræa lobata* and the *Gaultheria hispidula* in their roots and stalks."

But that oil of wintergreen was used somewhat in domestic medicine about that date, and also by Dr. Wooster Beach, the forerunner of Eclectic medicine, is evidenced, for Dr. Beach (49) in his *American Practice of Medicine*, Vol. III (1833), concerning *Gaultheria* ("*Gaulthera*") *repens*, states that "The oil relieves the toothache."

Antedating this paper, the reviewer has not succeeded in finding any reference whatever to oil of gaul-

Digitized by Google

theria being used in medicine, although the plants that contain it were generally recognized in pharmacy, the oil being distilled by primitive methods and known to druggists. Thus, as showing that even if used at all, it could not have been important, reference needs only be made to a few of the many authorities who would not have overlooked it, had it been thus employed. These are:

Amoenitates Academicae III, p. 14, 1787.

"*Gaultheria*, Kalm. (385) (Gen. 487).—*Uses* foliorum in infuso, loca Theæ. *Dixit* plantam Cl. Kalmius a D. D. Gaulthier, Medico Canadensi, Botanico eximio." *No reference to the oil.*

Benj. Smith Barton. Collections (43.) Phila. 1798. p. 19.

"The *Gaultheria procumbens*, which we call Mountain Tea, is spread very extensively over the more barren, mountainous part of the United States," etc. *Does not mention the oil.*

Pharmacopeia of the Mass. Medical Society (503) Boston, 1808

No mention of the oil or plant.

W. P. C. Barton, Mat. Med. I, p. 171, 1817. (43a).

Although he describes the medicinal virtues of Gaultheria in detail, he does not mention the oil. However, as showing that oil of gaultheria was distilled preceding 1818, I will cite

Bigelow, Amer. Med. Botany (69), II, p. 28. Boston, 1818.

Pyrola umbellata (p. 15) is herein called Wintergreen.

Gaultheria procumbens (Partridge Berry):—"The aromatic flavor of the Partridge berry, which can not

Digitized by Google

easily be mistaken by those who have once tasted it, may be recognized in a variety of other plants whose botanical habits are very dissimilar.

"It exists very exactly in some of the other species of the same genus, particularly in *Gaultheria hispidula*, also in *Spiræa Ulmaria* and the root of *Spiræa lobata*. It is particularly distinct in the bark of sweet birch, *Betula lenta*, one of our most useful and interesting trees.

"This taste and odor reside in a volatile oil, which is easily separated by distillation. The essential oil of Gaultheria, which is often kept in our druggists' shops, is of a pale or greenish-white color, and perfectly transparent. It is one of the heaviest of the volatile oils, and sinks rapidly in water, if a sufficient quantity be added to overcome the repulsion of the two heterogeneous fluids. Its taste is aromatic, sweet, and highly pungent.

"The oil appears to contain the chief medicinal virtue of the plant, since I know of no case in which the leaves, deprived of their aroma, have been employed for any purpose. They are nevertheless considerably astringent, etc.

"The leaves, the essence, and the oil of this plant are kept for use in the apothecaries' shops.

"The oil, though somewhat less pungent than those of peppermint and origanum, is employed for the same purposes," etc.

In this connection, as indicating that the oil was unimportant, perhaps simply an article of curiosity to pharmacists, it may be pointed out that the *American Dispensatory* of J. R. Coxe, 1825, mentions oil of gaultheria, but does not say anything with regard to its value or use in medicine.

Digitized by Google

The edition of 1818 does not mention the plant or oil at all.

In studying the pharmacopeial record of gaultheria oil, in connection with its materia medica and dispensatory history, the fact becomes apparent that: oil of gaultheria was made in a primitive way by country people (as is still largely the case), about the beginning of this century. Photographs of the crude still used in the distillation of the oil of birch have been presented by Dr. Charles G. Merrell to the Lloyd Library.

Oil of gaultheria was introduced into the list of known essential oil-bearing plants of America in the first (1820) *Pharmacopeia*, but was not described. Following this, such works as the Dispensatories and American Materia Medicas gave the oil a complimentary position, but it remained of no importance until brought forward by the analysis of Swaim's Panacea. Not until long after 1820 did any European Dispensatory or Pharmacopeia give it position.

SUMMARY.—Oil of gaultheria was distilled for druggists previous to 1820, but no public description of the apparatus or method was printed.

The Pharmacopeia of the United States, 1820, gave the first authoritative process of making it.

It was prominently introduced to the profession by the New York Medical Society, 1827, under whose auspices the oil was established, as a characteristic constitutent of Swaim's Panacea, the report being published in 1829.

We know of no pharmacopeial or authoritative direction for making oil of gaultheria from any source whatever which precedes the first (1820) *Pharmacopeia of the United States*, and have discovered no

Digitized by Google

BIRCH OIL STILLS (Page 144)

Upper. TYPICAL CONNECTICUT BIRCH OIL DISTILLERY NEAR NEW LONDON, CONNECTICUT

Lower. MODEL OF TYPICAL NORTH CAROLINA BIRCH MILL IN NATIONAL MUSEUM

Presented by The Wm. S. Merrell Company.

Digitized by Google

Digitized by Google

reference to its being made from gaultheria or sweet birch preceding Bigelow, 1818.

Thus it is evident that although the plant gaultheria has the advantage concerning conspicuity of name, the same date of introduction and same reference, (Bigelow), must be ascribed to both oil of gaultheria and oil of birch.

SWAIM'S PANACEA.—The important fact elucidated by the foregoing history of oil of gaultheria, to-wit, that it first received recognition in this once popular remedy, leads to a few words concerning this compound. In the beginning of the past century, a French proprietary remedy, "Rob de Laffecteur," was very popular throughout France and her colonies. It was invented by a French apothecary Boiveau, who affixed to it the name of Laffecteur to make it popular. In 1811 certain New York physicians used this "Rob de Laffecteur" with satisfaction, and Dr. McNevin, who obtained the formula from a French chemist, M. Allion, made its composition public.

Mr. Swaim, a bookbinder, was treated by Dr. A. L. Quackinboss and experienced great benefit from the remedy. Procuring the formula from Dr. Quackinboss, his physician, he modified it considerably, and put the mixture on the market under the name "Swaim's Panacea." This became very popular, and at last attracted the attention of the medical profession. By the analysis of Mr. Chilton, 1829, under the auspices of the New York Medical Society, it was positively shown that Swaim had replaced the sassafras of Quackinboss' formula by wintergreen oil, and had also introduced corrosive sublimate into the mixture.

Digitized by Google

Persons interested in this formula and subject will find detail reports as follows:

American Journal of Pharmacy, 1827, p. 123, (17b).

American Journal of the Medical Sciences, 1829, 4, p. 530, (17a), and 5, p. 542, (17a).

GELSEMIUM

— (Gelsemium, Yellow Jasmine or Jessamine)

First mentioned in 1860, Secondary List. Transferred to Primary List in 1870. Official in all later editions.

Common Names, Yellow Jessamine, Jessamine, Carolina Jessamine, Wild Woodbine, White Poison-Vine, White Jessamine.

Gelsemium sempervirens is a native of the Southern United States, abounding in the swamps, woods and thickets, from Virginia to Florida. It is a handsome climber, twenty to fifty feet in length, blooming in early spring, its flowers being overpoweringly fragrant. The name, given by Jussieu, was derived from the Italian word *Gelsomina*, meaning jasmine. But it is not a jessamine, and inasmuch as there is a true jessamine with yellow flowers, E. M. Holmes (322), of London, considers it unfortunate that the term *yellow jessamine* has been applied to it. This common name, however, is now firmly established. Its Italian name, *Gelsomina*, possibly led Eclectic authors to use the name gelsem*inum* (instead of gelsem*ium*), a term found abundantly in early Eclectic literature, and not yet altogether displaced. In this connection it may be said that Professor Scudder invariably used the word *Gelseminum*.

Medical History.—Barton and his co-laborers did not mention gelsemium, but Rafinesque, 1830, (535), gave it a place, stating that "root and flowers are nar-

Digitized by Google

cotic, their effluvia may cause stupor, tincture of the root is used for rheumatism in frictions," a statement taken almost literally from Elliott's (227) *Botany of South Carolina and Georgia*, 1821. The medical record, (King) (356), had its origin through the mistake of a servant of a Southern planter who was afflicted with fever. This servant, by error, gave his master a decoction of gelsemium root instead of the garden plant intended. Immediate loss of muscular power and great depression followed, all control of the limbs was lost, the eyelids drooped and could not be voluntarily opened. Death seemed imminent. But the effects finally wore away and the man recovered, free from fever, which did not recur. An observing physician took this experience as a text, and prepared from gelsemium a remedy that he called the "Electrical febrifuge," which attained some popularity. Finally the name of the drug concerned was given to the profession. This statement is found in the first edition of King's *American Eclectic Dispensatory*, 1852, which work actually presented gelsemium to the world of medicine, although the plant had a recorded position much earlier. King's article on gelsemium was reproduced in substance by the *United States Dispensatory*, 1854, none of the preceding nine editions of that work having mentioned the drug. But the fact is, that Porcher,[1]

[1] Francis Peyre Porcher was born December 14, 1824, St. John's, Berkeley Co., S. C., being the descendant of a French Huguenot family. In 1847 he graduated from the South Carolina State Medical College, Charleston, where he afterward became a professor of Clinical Medicine and Materia Medica. For many years he was editor of the *Charleston Medical Journal and Review*, was corresponding member of the Academy of Natural Sciences, and Fellow of the College of Physicians, Philadelphia. He was President of the S. C. Medical Association, and during the Civil War was Surgeon in Charge of the Confederate Hospitals, Norfolk and Petersburg, Va. In 1849 he contributed a "Report on the Indigenous Medicinal Plants of South Carolina," Am. Med. Assoc., 176 pp., and in 1854 wrote for the Am. Med. Assoc. a paper on "The Medicinal and Toxicological Properties of the Cryptogamic Plants of the U. S.," 126 pp. In 1863 he wrote his (now rare) monumental production in behalf of the Confederacy, "*Resources of the Southern Fields and Forests*," by direction of the Surgeon General of the C. S. A. Dr. Porcher died in Charleston, S. C., November 19, 1895.

Digitized by Google

(520), commended gelsemium in his report to the American Medical Association, 1849, referring to Frost's *Elements of Materica Medica* (250), South Carolina, as well as to several local journal articles.

For a long time following 1852, when King's *American Dispensatory* appeared, gelsemium remained an almost exclusive remedy of physicians of the Eclectic school, but in 1860 it attained a position in the *United States Pharmacopeia*, although not until 1880 did that work give place to any preparation of gelsemium. At present the drug is in much favor with physicians generally.[1]

GENTIANA (Gentian)

Official in all editions of *U. S. P.*, from 1820 to 1910.

Gentian, *Gentiana lutea*, is indigenous to the mountainous parts of Middle and Southern Europe, being found in the Pyrenees, the Islands of Sardinia and Corsica, the Alps, and elsewhere. It is not, however, found in the British Islands. Gentian is mentioned by both Pliny (514) and Dioscorides (194), its name being derived from Gentius, a king of Illyria, B. C. 180. Throughout the Middle Ages gentian was used as a domestic medicine and as an antidote to poisons, and in recent times it has been commended as an antidote or substitute for tobacco. In 1865 a very popular "Tobacco Antidote," twenty-five cents for a two ounce package, was found by this writer to be a mixture of

[1] In this connection it may be stated that Gelsemium has often been presented by such journal contributors as Drs. John Scott, Isaac Ott, E. A. Anderson, G. S. Courtright, W. C. Hull, and many others. Professor Roberts Bartholow gave it great attention in his *Materia Medica*, and also in journal contributions in both Europe and America. Professor T. J. Wormley gave its alkaloid chemical consideration, while Drs. Ringer and Murrell in the London *Lancet*, 1875-76-78, made admirable researches. The American interest in Gelsemium, outside the Eclectic school, notwithstanding the clinical evidence of the authorities we have mentioned, and others who might be named, is founded on the work of Bartholow, Wormley, Ringer and Murrell. Professor L. E. Sayre of the University of Kansas has made the most recent study of its alkaloids.

Digitized by Google

Upper. TURKS DIGGING LICORICE IN THE VALLEY OF THE MEANDER.
Old Roman road in background.

Lower. TURKS EATING LUNCH (Page 153, No. 1)
Licorice in background.
Photographed by John Uri Lloyd.

Digitized by Google

Digitized by Google

licorice root 3 parts, and gentian 1 part. The promoting advertisement claimed that if chewed instead of tobacco, within a reasonable time it "antidoted" the desire for tobacco. Be it remarked that about that date "fine cut" chewing tobacco (shredded leaf) was introduced to replace "plug" tobacco.

Tragus (650) employed the dried root of gentian 1552 A. D. for the purpose of dilating wounds. Gentian is now in common use in medicine as a bitter tonic.

GERANIUM (Geranium, Cranesbill)

Official, in all editions, from 1820 to 1900. Dropped from 1910 edition.

Cranesbill, *Geranium maculatum*, is native to the lowlands and open woods and copses throughout the temperate Eastern United States. Being one of the astringent domestic remedies used in the form of infusion or decoction in diarrhea, dysentery, sore mouth and similar diseases, it came thus to the attention of observing American physicians, whose use of it finally led to its place in the *Pharmacopeia*. In Eclectic medication especially geranium is much valued, and occupies a well-established position in all the publications of that school of physicians.

GLYCYRRHIZA (Licorice Root)

Official in all editions of *U. S. P.*, from 1820 to 1910. *U. S. P.* 1910 gives as source of Licorice Root *Glycrrhiza glabra typica* (Spanish Licorice) or of *Glycyrrhiza glabra glandulifera* (Russian Licorice).

Licorice, the dried rhizome and root of glycyrrhiza, is mentioned by Oribasius (479a) and Marcellus (404) in the 4th century, and by Paulus Ægineta (494) in the 7th century. It was known in the time of Dioscorides

Digitized by Google

(194), and was commonly known in Europe during the Middle Ages. Its price in England, in the day of Henry III, was equal to that of grains of paradise. It was one of the articles paying duty to aid in the repairing of London Bridge in the day of Edward I, 1305. Saladinus, (570), in the 15th century, mentioned it as an Italian medicine, and it was commonly known in the city of Frankfort in 1450. Matthioli (414), in 1574, states that the juice, in the form of pastilles, was brought every year from Apulia. Indeed, the record of licorice is to the effect that it has been an article of domestic use, as a "sweet wood" for chewing, as a constitutent of medicinal pastes, and in the form of a common water extract, since the earliest times. It is found in large quantities in the localities where it is cultivated, in Sicily, Italy and Spain, while in comparatively recent years whilst traveling in Turkey we have noted the immense amounts of licorice roots annually collected in the valleys of the Hermes and the Kayster, Turkey, where it has probably grown wild from all times. While studying the products of those valleys, we observed the diggers of licorice, who, contrasted with well-to-do Turks, are on a par with our American root diggers. They sell their product to the local depots of the American Tobacco Company. From daylight to dark these people work, for a bare living.

The licorice plant reminded us somewhat of the wild "Trumpet Creeper" of Kentucky, which, once established, is so persistent in root shoots. We found licorice creeping up, even through the crevices of the stones of the old Roman roads in the valley of the Meander, leading to Ayásoluk. This reminded us that we had seen the trumpet creeper shoots, forty feet from

Digitized by Google

Upper. NIOBE WEEPING FOR HER CHILDREN
This historic figure of "The Sorrowing Mother," carved on the mountain top, antedates history It overlooks the valley of the Meander, noted for wild licorice.
(Contrast with persons at its base.)

Lower. VALLEY OF THE MEANDER (Page 154, No. 2)
Historically celebrated from all time. Old Roman road to the right.
Photographed by Mrs. John Uri Lloyd.

Digitized by Google

Digitized by Google

a parent stock, creeping through a floor crevice in a Kentucky home, even slipping up between the stones of the hearth.

GOSSYPII CORTEX (Cotton Root Bark)

Introduced into *U. S. P.* in 1860, Secondary List. Official from 1870 until 1900. Dropped from 1910 edition.
Gossypium, *the fiber*, has been official in all editions from 1850.

Cotton root bark, *Gossypii radicis cortex*, is used as a stimulant and emmenagogue, the decoction being considered, in the days of American slavery, capable of producing abortion. It was thus introduced by the negroes, and from thence came into the hands of the profession, being first employed by physicians of the Southern United States. Following this introduction, Wallace Brothers, of Statesville, South Carolina, at the request of the writer, (*Eclectic Medical Journal*, [217] February, 1876), forwarded to him a barrel of fresh cotton root bark, preserved in alcohol. This was made into a fluid extract, and distributed to American practicing physicians, with a request that the results of its use be reported, in contrast with the preparation from the dried bark, deemed by some to be inert. A summary of more than forty reports from practicing physicians, together with remarks concerning the preparation of gossypium employed, was read before the Twenty-Fourth Annual Meeting of the American Pharmaceutical Association, 1876. This treatise, together with the increasing demand from physicians throughout America for preparations of gossypium root bark, led to its introduction to the *Pharmacopeia of the United States*. The credit for the discovery of its uses must be given to the negroes of the South. The *Lilly Scientific Bulletin*, Series 1, No. 10, July, 1920, "Contribution

Digitized by Google

to the Pharmacology of Cotton Root Bark," by Charles R. Eckler, M.S., devotes much research to gossypium. The results conflict with the opinions of physicians using the drug in clinical practice.

Cotton fiber and root bark are obtained from one or more cultivated species of *Gossypium herbaceum.*

GRANATUM (Pomegranate)

Granatum has an interesting history. The earliest *U. S. P.*, 1820, mentions it, but in the Secondary List, the part used being designated as "Cortex fructus. The rind of the fruit." The Philadelphia edition of 1830 transfers the drug to the Primary List, but retains the description of Granatum as "The rind of the fruit." In the New York edition of 1830 we find the first mention of the use of "*Granati Cortex, Pomegranate Bark,*" which alone is recognized. From 1840 to 1870, both *Pomegranate Rind* and the *Bark of the root* are official. The 1880 *U. S. P.* limits Granatum to "The bark of the root," while all later editions admit the bark of both stems and roots.

Punica Granatum has been in cultivation from the earliest historical times. It is now found in all warm countries of the world, and as an ornamental plant is frequently cultivated in this country, where it requires protection during the winter season, as it will not endure the cold. It is recorded that in 1838 the pomegranate trees in the neighborhood of London were killed by the frost. The form of pomegranate generally grown as ornament is the double variety, which is consequently barren. The fruit has been esteemed a delicacy from the most ancient time, and is often offered for sale at our fruit stands. In the West Indies, where the plant would thrive naturally, it is not extensively cultivated, and a writer on botanical history, (C. G. Lloyd), who has visited all these islands, does not remember to have seen it or its fruit wild. Like all cultivated plants it is liable to variation, and several of its forms have been

Digitized by Google

considered distinct species and so named by several authors. They are now all considered forms of one species.

The pomegranate shrub, according to De Candolle (122), was originally a native of Persia and adjacent countries, but has been cultivated and naturalized in the Mediterranean countries at such an early date that it has even been considered indigenous to these sections.

Pomegranate was included among the vegetable products held sacred by the Assyrians (86) and Egyptians (688); the latter made it a custom to place in the graves of their dead, fruits of the field and garden, among them pomegranates, specimens of which are preserved to the present day (239). The pomegranate had undoubtedly an occult significance with the ancient nations. It was frequently used as a mystical emblem in adorning the capitals of Assyrian and Egyptian columns, and the Bible (I Kings, vii: 18, 20), tells us that in the building of Solomon's temple, the capitals of the columns were decorated with a "network of pomegranates." Also, (Ex. xxviii, 33, 34), the hem of the high priest's robe was adorned with imitations of pomegranates in blue, purple and scarlet, alternating with bells of gold. The pomegranate was one of the fruits brought to Moses by the men sent to spy out the land of promise (302). Many other passages scattered throughout the Bible testify to the esteem in which the tree and the fruit (then called rimmon), were held in ancient times. The fruit and seed of the pomegranate are often mentioned in the *Arabian Nights*.

Pomegranates were represented on Carthaginian and Phenician medals (422) and on the reverse of coins of the island of Rhodes (688). In Greek mythology

Digitized by Google

the pomegranate is very conspicuous, symbolizing fecundity and abundance. The fruit was dedicated to Juno, a deity always represented in sculptures as holding a pomegranate (191).

The Greek authors; as Theophrastus (633), described the pomegranate under the names of "roa" and "roa side;" also, Dioscorides (194) quite explicitly sets forth the medicinal properties of different parts of the plant. Among Roman authors who describe the pomegranate and its uses are Cato Censorius (132). Pliny, Celsus (136), and others. Subsequent writers, for example the Arabians, in the 9th century also refer to the pomegranate, but seem to have mainly repeated the substance of the writings of their Greek and Roman predecessors (422). The *Arabian Nights* (Burton edition) speaks of the use of the seed, cooked, as follows: "Every day I cook five dishes for dinner, and the like for supper; and yesterday they sought of me a sixth dish, *yellow rice*, and a seventh, a mess of *cooked pomegranate seed.*" (*Adventures of Mercury Ali of Cairo*, Vol. VII, p. 185). Of the writers of the Middle Ages may be mentioned Tragus and J. Bauhinus (47), the latter giving a most detailed compilation of that which was known before his time on the pomegranate, including connected myths. It was not until the present century, however, that the literature of pomegranate was enriched by the study of its chemical aspects.

GRINDELIA (Grindelia)

Grindelia robusta was introduced into the *Pharmacopeia* of 1880. In 1890 and 1900 two varieties are named, *G. robusta* and *G. squarrosa*, while in the *U. S. P.* 1910, G. robusta is dropped altogether, the varieties mentioned being "*Grindelia camporum* Greene, or *Grindelia cuneifolia* Nuttall, or *Grindelia squarrosa* (Pursh) Dunal."

Digitized by Google

Grindelia robusta, a California plant, as found in commerce, is of questionable authenticity, owing to the near relationship of other very similar species of grindelia. It early attracted the attention of the Jesuit Fathers in their mission stations along the coast, it being used by the natives before the conquest of the country by the Americans. Dr. C. A. Canfield, of Monterey, Calif., about 1863, called attention to grindelia as a remedy in the poison of *Rhus Toxicodendron*, its native use in that direction having become known to him. Mr. James G. Steele, of San Francisco, 1875, contributed a paper to the American Pharmaceutical Association, commending grindelia in this direction. After that time the drug rapidly crept into favor with the profession of medicine. Its introduction is to be credited to Parke, Davis & Company, of Detroit. See *"New Preparations"* (467).

GUAIACUM (Guaiac)

Both the resin and the wood of Guaiacum were recognized from 1820 to the year 1890, the 1820 edition giving as its common name *Lignum vitæ*. The editions of 1900 and 1910 limit the official drug to the "resin of the wood of Guaiacum." Officially recognized by the *U. S. P.* 1910 as derived from *Guaiacum officinale* or from *Guaiacum sanctum*.

Guaiacum is a low evergreen tree, native to the West Indies and Southern Florida. Its earliest importation into Europe was from San Domingo, as recorded by Oviedo (487), 1526 A. D.; but that it was known previously in Germany, is proved by treatises by Nicholaus Poll (517), 1517; Leonard Schmaus (578), 1516; and Ulrich von Hutten (332), 1518, by whom it is given a place. Oviedo, who landed in America in 1514, observed the tree, called by the natives *Guayacan*.

Digitized by Google

This drug, and its resin as well, was used empirically in domestic (native) medicine before its introduction to the profession.

Resin of Guaiacum is a product obtained from slow combustion, wherein, by a very crude method, a horizontal guaiacum log, raised from the ground, is slowly burned, the liquid resin collecting in grooves cut in the log. The resin is used more extensively than is the wood.

GUARANA (Guarana)

Introduced into *Pharmacopeia* in edition of 1880. Official in later *Pharmacopeias*, through 1910.

Guarana, a dried paste from the crushed seeds of *Paullinia Cupana*, was introduced into France from South America by a French officer in 1817, as a product of an unknown plant. This paste was made and used by the tribe of Indians (Guaranis), from whom it took its name. In 1826 Martius (409) identified the plant which is called *Paullinia sorbilis* in deference to Simon Paulli (493). In 1840, (*Am. Journ. Pharm.*), (17b), Dr. Gravelle presented to the Paris Society of Medicine a specimen of guarana, which was analyzed by M. de Chastetus, who discovered therein "a crystallizable matter, which possessed the chemical properties of caffeine." In 1888, Professor H. H. Rusby, (564) (*Amer. Journ. of Pharmacy*, p. 267), authoritatively described the manner in which the natives prepared Guarana from the seed, and in their crude way produced the smoked sausage-like rolls familiar in commerce. The date of its discovery by the Indian tribes whose preparation and use of guarana as "a stimulating substance" led to its European notice, is lost to record.

Digitized by Google

HAEMATOXYLON (Logwood)

In all editions of *U. S. P.* from 1820 to 1900. Dropped in 1910.

Logwood, *Hematoxylon campechianum*, L., is the wood of a tree used throughout the civilized world as a dye stuff, its use being most largely in this direction. The tree is native to Central America, it being abundant in Campeachy, Honduras, and other sections of that country. Flückiger (239) accepts that the wood was introduced into England in the latter half of the 16th century, because in 1581 its use was abolished by act of Parliament, for the reason that it was considered a poor substitute for better dyes, and it was viewed in the light of a sophisticant. Eighty years later, probably because a *better* study had rendered its use more practicable, logwood was again permitted to enter England. According to De Laet (368), 1633, one of the names by which it was commonly known, *Peachwood*, was derived from the town of Campeachy, whence the wood was exported in quantities to Europe. The accounts of travelers and sailors at the time of the great excitement produced by the discovery of the abundant sources of wealth in the new world almost universally mentioned logwood. This is evident from such records as appear in sailors' descriptions of their voyages, in *Chambers Miscellany*, and elsewhere.

In the form of a decoction of its chips, logwood has been a favorite in domestic medicine, and owing to its mild astringency, it was used for a considerable time by licensed physicians. In 1746, under the name *Lignum tinctile Campechense*, it became official in the *London Pharmacopeia*.

Digitized by Google

HAMAMELIDIS CORTEX ET FOLIA

Hamamelis Leaves, official in 1880 and 1890. Both the bark and twigs, and the leaves, official in 1900. Hamamelis not recognised in 1910, excepting as the "distilled extract of Witch Hazel," *Hamamelis Water*.

Witch-hazel, *Hamamelis virginiana*. The decoction and infusion of the bark, as well as of the leaves of this shrub, have been in common use from the days of the American Indian, whose use of the plant led the settlers to its employment. They also used the leaves as well as the pounded bark in the making of a poultice for topical use in inflammation. These domestic uses of hamamelis led to its introduction to the medical profession at an early date. A mixture of hydrastis root and hamamelis leaves was held in high repute by Professor John King, M. D., (356), as a wash and as an injection. The preparation known as "distilled hamamelis," or "distilled extract of hamamelis," introduced by Dr. Pond about the middle of the 19th century, became very popular, and has an increasing demand at the present time, a substitute being introduced into the *Pharmacopeia* under the title "Hamamelis Water." The writer is now engaged on a detailed study of "Distilled Extract of Witch Hazel," not belonging in this volume, concerning which he has collected much interesting information, including its authoritative early record.

HEDEOMA (Pennyroyal)

Not found in the *U. S. P.* of 1820, or in the 2d edition, in 1828, but is named in both the New York and Philadelphia editions of 1830. Official in all editions thereafter until and including 1900. Dropped from 1910 *U. S. P.*

American pennyroyal, *Hedeoma pulegioides*, is a fragrant herb native to America, and generally dis-

Digitized by Google

tributed throughout the temperate portions of North America. It was used by the Indians in the form of decoctions and infusions, as well as to keep off insects, and by them it was introduced to the settlers, coming thence to the attention of the medical profession. Its chief use at the present time is in the making of the volatile oil distilled therefrom, which is mainly employed as a protection against insects. This plant must not be confused with the pennyroyal of Europe, a small, aromatic herb, *Mentha pulegium*, common throughout Europe, extending northward to Sweden, eastward to Asia Minor and Persia, and southward to Abyssinia and Arabia. The European pennyroyal, also a common domestic remedy, has fallen into therapeutic neglect by the profession.

— HUMULUS (Hops)

Official in every edition of *U. S. P.*, from 1820 to 1910.

Hops, *Humulus Lupulus*, is a climbing vine found in thickets and along river banks throughout Europe, and extending to and beyond the Caucasus and Caspian regions. Introduced into America, hops have become acclimated, and especially in the Northwest are cultivated in immense quantities. Hop gardens existed in France and Germany in the 8th and 9th centuries, and "Bavarian hops" were esteemed in the 11th century. It has been asserted that William the Conqueror, 1069, granted the use of land for hop culture in England. The original use of hops was in decoction as a stomachic medicine, or a mild soporific, whilst their employment in the making of malted liquors is familiar to all. As a tonic, the hop is still valued in simple decoction and in extract, both by the people and the profession of medi-

Digitized by Google

cine. A "hop bag" wetted with alcohol and placed hot, on an inflamed part, is of great service.

HYDRASTIS (Golden Seal)

Introduced in 1860 (Secondary List). Official in all later editions.

Hydrastis canadensis is a native of North America. Once abundant in the thick woodlands of the Central West, in the territory bordering the Ohio River from Illinois to Virginia, it is now, in its native home, practically exterminated. Hydrastis is known by the common names golden seal, yellow puccoon, yellow root, and other similar expressive appellations signifying its color, or applying to its nature. The root of this plant, of a rich golden yellow, like its companion, sanguinaria, which, however, has a red color, was used by the Indians as a cuticle stain, and also as a dye for their garments. Being exceedingly bitter, it was also useful in repelling insects, when mixed with grease and smeared upon the skin, and hence served a double purpose in the use of primitive man. Its first printed conspicuity came from a paper read by Mr. Hugh Martin (408) before the American Philosophical Society, 1782, published in their *Transactions*, 1793, under the title "*An Account of some of the Principal Dyes employed by the North American Indians.*" By reason of its red berry, hydrastis was also called *ground raspberry*. Although it had been mentioned in various medical publications, the drug was held in slight repute, and was of no commercial importance until the advent of the American Eclectics, who first prepared its alkaloidal salts for professional use. (388a). Its medical history therefore dates from its use by the Indians, who introduced it as

Digitized by Google

HYDRASTIS CANADENSIS (Page 164)

Presented by H. K. Mulford Company.

Digitized by Google

Digitized by Google

a native remedy to the earliest botanical explorers, and to settlers. Its therapeutic qualities were overlooked, however, by Kalm (350), 1772; Cutler (178), 1783, and Schöpf (582), 1785; Barton (43) first in a brief note bringing it before the medical profession, 1798. He credits the Cherokee Indians for its uses, and in the third part of his work, 1804, he devotes considerable attention to the drug. Rafinesque (535), 1828, states that the Indians employed hydrastis as a stimulant, and that the Cherokees used it for cancer, but that for this purpose better remedies were known to them. The principal use of hydrastis by the Indians, however, and the use which afterwards crept into domestic practice, was as an infusion or wash for skin diseases and for sore or inflamed eyes. It was also employed as a stimulant for indolent ulcers, and as an internal tonic. Hydrastis may be considered typical of the drugs that are employed very extensively by the medical profession, through their empirical introduction, it being recorded that even for gonorrhea the Indians discovered its utility.

Early authorities on American medicinal plants, such as Barton (43), 1798 and 1804, Hand (298), *House Surgeon*, 1820, Rafinesque (535), Elisha Smith (601), 1830, Kost (361), 1851, Sanborn (571), 1835, give to hydrastis considerable conspicuity, whilst Dunglison's *Medical Dictionary* (203), 1852, erroneously states that in Kentucky, only, it is used, and then only as an outward application for wounds. (See *Drugs and Medicines of North America* (389), pp. 154-5. This gives the most complete study of hydrastis and its alkaloids extant).

The voluminous chemistry of the hydrastis alkaloids lies in the province of Dr. Waldbott and Prof. Heyroth.

Digitized by Google

Briefly, "The Relationship of Hydrastine and Berberine to One Another, and Their Mode of Combination in the Drug," is discussed by Dr. A. R. L. Dohme, *Proc. Amer. Pharm. Assn.*, 1894, pp. 188–190. The subject concerns pure chemistry and can not be properly treated in this history of drugs, but reference thereto should not be neglected. To this it may be added that in 1899 Dr. Dohme continued the subject (*Proc. Amer. Pharm. Ass'n.*, 1899, pp. 280–283) from a purely assaying phase, the conclusions being that "spring-dug Golden Seal is fully equal to fall-dug, in content of the white alkaloid." Research Laboratory of Sharp & Dohme.

HYOSCYAMUS (Henbane)

Official in every edition of the *U. S. P.* The Philadelphia edition of 1830 recognizes the leaves only. All others name "the plant," or the leaves and seeds.

Hyoscyamus niger is distributed throughout Europe, from Portugal and Greece to Norway and Finland. It is found in the Caucasus, Persia, throughout Asia Minor, Northern India, and even in Siberia. It has been naturalized in North America and Brazil, and in England it is a common weed. Dioscorides (194) mentions it among medicinal plants, and under the name *Henbane* it has been employed in European domestic medication from the remotest times. Anglo-Saxon works on medicine in the 11th century give it a place. During the Middle Ages the seeds and roots were much used. Its employment and reintroduction to modern regular medicine, after it had fallen into disuse, came through the efforts of Störck (617). Its qualities were well known to the Arabians, as is witnessed in numerous

Digitized by Google

references thereto in the "*Arabian Nights*," (88), of which the following is a sample:

"Presently he filled a cresset with firewood, on which he strewed powdered *Henbane*, and lighting it, went round about the tent with it till the smoke entered the nostrils of the guards, and they all fell asleep, drowned by the drug." History of Gharib and his Brother Ajib, Vol. VII, p. 7.

In the reproduction following, had Herodotus not said *tree*, it might be accepted that the volatile intoxicant mentioned by him, referred to this drug. The presumption need not have disturbed an author who made errors more pronounced than the distinction between an herb and a tree, and who wisely qualified his statement by "it is said." Indeed, as shown in our article on *Matico*, that plant was originally described as "Soldier's Herb or Tree."

"Moreover, it is said that other trees have been discovered by them which yield fruit of such a kind that when they have assembled together in companies in the same place and lighted a fire, they sit round in a circle and throw some of it into the fire, and they smell the fruit which is thrown on, as it burns, and are intoxicated by the scent as the Hellenes are with wine, and when more of the fruit is thrown on they become more intoxicated, until at last they rise up to dance and begin to sing." *Herodotus* (Macaulay), Book I, p. 99.

In like manner, probably through tradition, its uses came to the people. The grandmother of this writer, afflicted with asthma, found her greatest relief in smoking stramonium leaves, mixed with small amounts of hyoscyamus "henbane" leaves. This was probably

Digitized by Google

an heirloom of primitive European medication, transplanted to the settlers of the American wilderness, who added the stramonium to hyoscyamus.

IPECACUANHA (Ipecac)

Official in every edition of the *U. S. P.*, from 1820 to 1910. The *U. S. P.* 1910 makes official the root of *Cephaëlis Ipecacuanha* (Rio Ipecac of commerce) or of *Cephaëlis acuminata* (Cartagena Ipecac).

The plant which produces this drug, *Cephaëlis Ipecacuanha*, Richard, belongs to the large natural order of Rubiaceæ, which includes a large number of our medicinal plants, for example cinchona, spigelia and mitchella. Different authors have successively assigned the plant to different genera, (*Index Kewensis*, 1894), as follows:—*Uragoga*, Linnæus, 1731, *Psychotria*, Linnæus, 1759, *Cephaëlis*, Swartz, 1788, and *Callicocca*, Schreber, 1789. The following synonyms now exist:

1. *Uragoga Ipecacuanha*, established by Baillon in 1879, (Baillon, *Nat. Hist. Plants*, Vol. VII, p. 280, London, 1881), evidently by right of the priority claimed for the generic name, Uragoga.

2. *Psychotria Ipecacuanha*. This is the name now recognized by the *Index Kewensis*, in which Stokes, *Bot. Mat. Medica*, (1812), is credited as introducing the name of the species. The name was again authoritatively proposed in 1881 by Müller Argoviensis (Martius, *Flora Brasiliensis*, fasc. 84, 1881).

3. *Callicocca Ipecacuanha*, Brotero, 1802.

4. *Cephaëlis Ipecacuanha*, Willdenow, 1804.

5. *Cephaëlis Ipecacuanha*, De Candolle, 1804.

6. *Cephaëlis emetica*, Persoon, 1807.

7. *Cephaëlis Ipecacuanha*, Tussac, 1813.

8. *Cephaëlis Ipecacuanha*, A. Richard, 1820.

Digitized by Google

The beginning of the history of ipecacuanha root and the first study of its virtues is clouded in mystery and fable. It is stated that the South American Indians were acquainted with the medicinal properties of the plant, having gained their experience from observing the habits of animals (409). This fable has a parallel in the quaint description given by Clusius (153) concerning the discovery of the healing virtues of nux vomica bark in cases of snake bite. A vague, yet probably the first source of information on the subject of ipecacuanha root, is found in a work named "*The Pilgrimes*," by Samuel Purchas (527), published in London in 1625, which in five volumes gives an account of many travels, the natural history and products of foreign countries. In Vol. IV, page 1311, where Brazilian plants and their uses are considered, the following occurs:

"*Ipecaya* or *pigaya* is profitable for the bloudie fluxe. The stalke is a quarter long and the roots of another or more, it hath only four or five leaves, it smelleth much wheresoever it is, but the smell is strong and terrible."

The subsequent description of its medicinal virtues bears further evidence that the plant mentioned is at least closely related to official ipecacuanha. According to a printed note at the head of that chapter, the author is believed to be a Jesuit by the name of Manoel Tristaon (651a), who probably wrote the treatise in the year 1601.

The first definite information we have of ipecacuanha dates from the publication by Piso and Marcgraf (511), of a work called "*Historia Naturalis Brasiliæ*," Amsterdam, 1648, chapter lxiv being entitled, "*De Ipecacuanha ejusque Facultatibus.*" Two species of ipecac

Digitized by Google

are described, a white and a brown species, the latter evidently being the true ipecacuanha plant. An illustration is added, which Mérat considers quite a creditable reproduction of the true ipecacuanha. The entire chapter was reprinted, with French translation, by Mérat (422), and inserted in his "*Dictionnaire*," as a testimony of the extreme exactness of the description given by Piso (511).

Ipecac root first came to Europe in 1672 through the agency of Le Gras (422), who sought to introduce it into medical practice. Keeping a stock supply in the care of an apothecary by the name of Claquenelle in Paris, he associated himself with J. A. Helvetius (309), a physician of German descent, who had graduated under the medical Faculty at Rheims. However, the venture was at first a failure, owing to the employment of too large doses.

In 1680 a merchant by the name of Garnier in Paris, well acquainted with the medicinal virtues of the root, sent for a supply, obtaining 150 pounds from Spain. Through this gentleman, directly or indirectly, Helvetius (309) secured a new lot of the drug, which he skillfully managed to exploit by extensively advertising it as "radix anti-dysenterica," the origin of which, however, he kept a secret. Finally the fame of the remedy came to the notice of Minister Colbert, who ordered that it be given an official trial in the Paris municipal hospital.

In 1688 Helvetius (309) obtained the sole license for the sale of the drug, which proved to be an efficient, or at least popular, remedy among the members of an aristocratic patronage, including no less a personage than the dauphin. Through the combined influences

Digitized by Google

of his physician, Ant. d'Aquin, and of Franç. de Lachaise, confessor to the king, Louis XIV then bought the secret from Helvetius for one thousand louis d'or, and made it public property. Garnier, the merchant, next brought suit in order to obtain his share of profit in the transaction, but was unsuccessful in his effort.

The remedy having been thus legally established in France, it was introduced into other countries, e. g., by Leibnitz (378a), 1696, and Velentini (656b), 1698, into Germany, and into Holland in 1694 by Fried. Dekker.

During the first part of the 18th century, ipecacuanha was in frequent use in the various pharmacies of Germany, as is evidenced from its being mentioned in several old documents of that period. It is, for example, mentioned in the authoritative drug list of the Silesian town of Strehlen, in 1724.

However, during the increasing employment of the drug in the latter part of the 18th century, much confusion arose as to its botanical origin, insomuch that it became the habit to designate as ipecacuanha any emetic plant, regardless of its botanical source. A long list of such plants is enumerated, for example, in Martius (409). In this manner the characteristics of the plant furnishing true ipecacuanha root became almost forgotten, other plants being substituted for it. Ray, for example, held it to be a species of *Paris*, and no less an authority than Linnæus himself thought *Viola Ipecacuanha*, now known as *Ionidum Ipecacuanha* (684), to be the true ipecacuanha root.

In 1764, Mutis, a celebrated botanist in Santa Fe de Bogota, sent the younger Linnæus a Peruvian emetic plant with description, which he thought to be the true ipecacuanha root. Linnæus fil. (385) accepted the

Digitized by Google

statement of Mutis as correct, and, moreover, believing the illustration given by Piso (511) of the true ipecacuanha plant to represent the specimen he received from Mutis, in 1781 gave to it the name *Psychotria emetica*, Mutis.

To Dr. Gomez (271, 272), who in 1800 returned from Brazil, is finally due the credit of having corrected this error. He re-established the nearly forgotten botanical character of true ipecacuanha in his memoir published at Lisbon in 1801, wherein he describes and figures the plant, and especially distinguishes it from *Psychotria emetica*, Mutis.

Having donated some specimens of the plant in his possession to his fellow countryman, F. A. Brotero (100), professor of botany, Coimbra, the latter published an account of it, 1802, in the *Trans. Linn. Soc.*, naming it *Callicocca Ipecacuanha* (100), but gave no credit to the source of his information, which considerably chagrined Gomez (422). Twelve years later, Brotero left a copy of his article with a botanist by the name of Hectot, of Nantes, who communicated it to M. Tussac (656a), and the latter, in publishing it, gave to the drug described the name *Cephaëlis Ipecacuanha*, also laying stress upon its distinction from *Psychotria emetica*, Mutis, perhaps without having any knowledge of Gomez' paper published in 1801.

In 1820, A. Richard (550) again called attention to this distinction, but also without giving proper credit to Gomez, with the result that later authorities frequently quote the true ipecacuanha root under the name, *Cephaëlis Ipecacuanha*, A. Richard.

As is true of other new drugs, ipecacuanha in its early days suffered much from adulteration. One of

Digitized by Google

the adulterants was the root of an *Apocynum*, as described in Lewis' (382) *Materia Medica*, as follows:

"A root has been brought over under the name of white ipecacoanha, which has little or nothing of the virtues of the two foregoing: this is readily distinguished by its yellowish white colour, woody texture, and having no fissures or wrinkles. More dangerous abuses have sometimes been committed, by the substitution or mixture of the roots of an American *Apocynum*, which have been found to operate with great violence both upwards and downwards, and in some instances, as is said, to prove fatal; these may be known by their being larger than the true ipecacoanha, the fissures more distant, the intermediate spaces smoother, and more particularly by the colour of the medullary fibre, which in the poisonous roots is a deep reddish yellow, in the true ipecacoanha a whitish or pale greyish."

Cultivation and Collection of Ipecac.—The peculiar structure of the flower requires the intervention of insects for the purpose of fertilization; when cultivated in hot houses, it is necessary to transfer mechanically some pollen to the stigma, if the plant is expected to bear fruit.

In 1849, Weddell called attention to the fact that if a fragment of the plant be allowed to lie on the ground for any length of time, it will strike root. The corners of the leaf stalks are especially prone to issue such adventitious roots, and the stem will also bud when in contact with the ground. This property of the ipecac plant was rediscovered in 1870 by McNab. Probably this reproductive power accounts for the plant resisting extermination, despite the rapacious method employed in collecting it.

Digitized by Google

The root is dug all the year round, but especially in the months of January and February, when the plant is in bloom. It is perhaps to be regretted that the collection is not postponed until May, when the fruit ripens, for then the scattered seeds would insure a new growth. It is said that, owing to the vicious system of collection, the plant has become scarce in the vicinity of large cities, as Rio de Janeiro. Professor Rusby states that the scarcity in trade during a recent period is also due to the fact that the attention of the natives has shifted towards the rubber industry. (*Pharm. Jour.*, 1889, p. 1056).

The most abundant growth of the drug, on the authority of Weddell, is to be found in the interior of the Brazilian province of Matto Grosso. The "poayeros," as the collectors of the plant are called, skillfully cut off the root, taking care to leave part of it in the ground, afterwards they carefully fill the hole again with earth. By taking this precaution, it is said that after three or four years a new crop may be gathered at the same spot. A skilled poayero collects thirty pounds a day, but the average is not more than six to ten pounds a day.

Since 1866 attempts have been made by the British to transfer the cultivation of ipecacuanha to India, but these seem not to have been successful. From one specimen sent to India by Hooker in 1866, an increase of but 11 plants resulted to the date of 1872. Upon McNab's discovery of the propagation by root, 300 specimens obtained in this manner were sent to India and planted in dark woods of the hot and moist valleys of British Sikkim in the Himalaya Mountains. Although they multiplied in one season to an aggregate

Digitized by Google

of 6,000 specimens, the cultivation seems from some cause to have been impractical. Arthur Meyer concludes from a study of the anatomy of the leaf, that the plant, while preferring dark locations, requires at least a certain amount of light, and suggests that cultivation may succeed better in moist woodlands in the direct shade of single trees.

In 1894, Dr. A. R. L. Dohme presented to the American Pharmaceutical Association (*Proceedings*) a valuable contribution to the chemistry of ipecac, under the title "The Relative Alkaloidal Value of Two Kinds of Ipecac Root." He established, by processes given in detail, that, contrary to the general opinion, "the upper part of the root, which frequently is in part a stem, contains more alkaloid than the lower or annulated part." (Research Laboratory of Sharp & Dohme.) From the interesting discussion we reproduce as follows:

"Mr. Caspari: This paper simply goes to show, Mr. Chairman, that it is not always best to buy that which commands a fancy price in the market. Here we have evidence of a root commanding in the market a high price being of less value than a commercially inferior grade, and the determination of the value must depend upon their alkaloidal percentage.

"Dr. Dohme: I would say in regard to the ipecac root that comes into the market in various forms under different commercial names that the true or 'fancy' root is made up of the part that is found below the ground, while the so-called 'wiry' root is both stem and root, and is made up of the part at the surface and above the ground; the 'wiry' root is the cheaper, the 'fancy' root being sometimes twice as high. Then there

Digitized by Google

are intermediate grades, depending upon the relative amount of the two kinds present. As my results show, this value is based upon a false assumption, for the 'wiry' root ought to be the most expensive, and the 'fancy' root ought to be the cheapest."

JALAPA (Jalap)

Official in every edition, from 1820 to 1910.

The purgative tuber known under the common name jalap, *Exogonium Purga*, is a gift of Mexico. The early Spanish voyagers learned of its cathartic qualities from the natives, and in the 16th century carried large quantities to Europe, where it naturally became a favorite, in the days of heroic medication. Monardes (447), in 1565, mentions a cathartic under the name Mechoacan rhubarb, or root, which some believe to have been jalap, but Flückiger (239) discredits this, because Colon, an apothecary of Lyons, in 1619, states that jalap was then newly brought to France. Flückiger also accepts that both drugs were well known in 1610, although often confused. Owing to this confusion between the bulbs, one was called *Black Mechoacan*, while the other was known as *White Jalap*. Strangely enough, the exact botanical source of jalap remained a question until 1829, when Dr. Coxe, (171), of Philadelphia, author of *Coxe's American Dispensatory*, identified the drug from living plants sent to him from Mexico, and published descriptions, with colored plates, in the *American Journal of Medical Sciences*, (17a), 1829. This celebrated cathartic, so much used by both licensed physicians and in domestic medication, is to be credited to the natives of Mexico, whose employment of the drug introduced it to European commercial adventurers,

Digitized by Google

who as a matter of business made it known to the professions of medicine and pharmacy.

KINO

Official in *U. S. P.*, all editions, from 1820 to and including 1910.

Kino is the dried juice of a handsome timber tree, *Pterocarpus Marsupium*, a native of the southern parts of the Indian Peninsula and Ceylon. It is also obtained from several other trees that partake of the qualities of an astringent drug. One of these, *Pterocarpus indicus*, is a tree of Southern India, the Malay Peninsula, and the Philippine Islands. The drug, used by natives from time immemorial, was introduced into commerce by Fothergill (244), 1757. It came from the River Gambia, in Western Africa, where it had been previously noticed by Moore (449), who in his "*Travels Into the Inland Parts of Africa*," 1737, mentioned the product under the name *Kano*. Mungo Park, 1805, sent specimens of the tree to England, and from that date African kino has been a regular product of the English drug market. According to Duncan (202), in the *Edinburgh Dispensatory*, 1803, kino as found in England was an African product, but he recognized a variety, indistinguishable from this, coming from Jamaica. In the 1811 edition of the same work he asserts that the African drug is out of market, and that the East India Company now supplies the market from Jamaica and New South Wales. It is evident that, as with Krameria, many species and varieties of the tree, native to widely different sections of the world, produce the substance known as kino, which, aside from the East India tree, *Pterocarpus Marsupium*, are accepted

Digitized by Google

as being very nearly identical with the material yielded by the kino tree of tropical Africa. Kino is obtained by incising the tree and removing the red jelly as it exudes, then drying it by exposure to the air. It is mildly astringent, and has been used in the manufacture of wine.

KRAMERIA (Krameria, Khatany)

Official from 1830, both editions, to 1900. Not mentioned in 1820, (nor in 2d edition, 1828), nor in 1910.

The shrub, *Krameria triandra*, is native to the bare and sandy slopes of the Bolivian and Peruvian Cordilleras, where it grows at from 3,000 to 8,000 feet above sea level. It is often found in great abundance, standing in solid beds scarcely a foot high, and peculiarly attractive by reason of its silver-gray foliage and star-like flowers. The root of commerce comes from the north and east of Lima, and the northern part of Peru. The Spanish botanist Hipolito Ruiz (562, 563), in 1784, observed the native women of Huanuco and Lima using this drug as a tooth preservative and an astringent.

On his return to Europe, in 1806, he introduced the root into Spain, and from that country it gradually spread throughout Europe. The first that reached England, however, was part of the cargo of a Spanish prize. Specimens of this came into the hands of Dr. Reece (540), who recommended it to the profession, 1806, in his *Medicinal and Chirurgical Review*, London. There are other species and kinds of rhatany, one, investigated by the writer of this article some years ago, as found in Florida, the qualities of which could scarcely be distinguished from those of the astringent South American drug. This Florida drug was also noticed by Dr. E. M. Hale, of Chicago, a well-known Homeopathic

Digitized by Google

author. *Krameria Ixina* was also official in past *Pharmacopeias*. Seemingly, the species of rhatany are all of similar nature, all being dependent for their virtue upon a kindly, astringent, red tannate.

LACTUCARIUM (Lactucarium)

Official from 1820 to 1910. In 1830, (Philadelphia edition) it was relegated to the Secondary List, but regained position in 1840.

Several species of *Lactuca* known to the Old World yield the juice which, when dried, is known as *Lactucarium*, an extract known also under the name lettuce opium. The fact that lettuce eaten frequently induces drowsiness was known in ancient times, and its reputation in this direction led Dr. Coxe (171), of Philadelphia, to suggest the collecting of the juice, after the manner employed in the making of opium. His experiments were published in 1799 under the title "Lettuce Opium." Since then, others writing on the subject created a demand for lactucarium thus produced. It will be seen that the introduction of this substance to medicine came through usual empirical channels. In this connection, a French proprietary syrup had large use (*Mayo*).

LAPPA (Burdock)

Introduced in 1850, but in Secondary List, occupying this position in 1860 and 1870. Official in 1880, 1890 and 1900. Dropped from 1910 edition.

This widely distributed plant, known under several botanical names, such as *Lappa minor* (De Candolle), *Lappa major* (Gärtner), and *Lappa tomentosa* (Lamarck), is now official as *Arctium Lappa*. The commercial name, *Burdock*, seems, however, so expressive

Digitized by Google

as to have become its universal appellation, needing no interpretation.

The root of this plant has ever been used in its native haunts, which cover much of Africa, Europe and adjacent lands. Like the honey bee, it follows civilization; and like the English sparrow, it craves the company of man. Its burr goes with man into all inhabited countries, and whether or not it be a welcome guest, its broad leaves are to be found about every dwelling. If the plant were rare, florists would probably consider it very attractive. Burdock has been used from time out of date in domestic medicine. Several varieties have inherited the common name, such works as Salmon, (570a), 1683; Samuel Dale, (179), 1737; Quincy, (532), 1749; Lewis, (382), 1768, and Motherby, (451b), 1775, testifying thereto. In all these it is titled *Bardana*.

LEPTANDRA (Leptandra, Culver's Root)

Introduced in 1860. Official in all editions following, including 1900, but dropped from 1910.

Leptandra, *Veronica virginica*, grows in rich woodlands throughout the United States east of the Mississippi River, being found in abundance wherever it is native to a section and the woodlands have remained undisturbed. The various species are known under many local names, such as black root, Culver's root, Brinton root, Bowman root, physic root, etc., as used by the settlers, who derived their knowledge of the drug from the Indians, and designated the plant from its characteristics, or from the name of the man who used it in his practice. The Delaware Indians called the plant *Quitel*, and the Missouri and Osage tribes knew it as *Hini*. Leptandra was employed in decoction by settlers

Digitized by Google

and savages alike, as a violent purgative, and in the practice of early physicians of the United States it was used for bilious fevers. Peter Smith (605), author of the "*Indian Doctor's Dispensatory*," 1813, states that his father used "Culver's Root" to cure the pleurisy, which it did "with amazing speed." The use of leptandra was confined to domestic medication until the appearance of the *American Dispensatory*, (356), 1852, which gave it a general introduction to the profession of medicine. Professor W. Byrd Powell, a Cincinnati physician of exceptional education, valued leptandra very highly, and it was upon his strong commendation to Professor John King (356), editor of the *American Dispensatory*, that it was given a position in that publication. The name *Leptandra* is based on its formerly recognized botanical name of *Leptandra virginica*.

LIMONIS, CORTEX ET SUCCUS

(Lemon, Peel and Juice)

Official, from 1820, through all editions. In 1840 we find the distinction first made between Lemon Peel and Lemon Juice. Lemon Peel, *alone*, is official in 1910.

The lemon tree, *Citrus Limonum*, is a native of the forests of Northern India, and occurs elsewhere through the adjacent countries. It has been known from the beginning of written history in its native land, but its mention in Sanskrit literature occurs in more modern times, rather than in antiquity. The Arabian writers gave it the name *limun*, from the Hindu word *limbu*, or *limu*. (See extract from article of Dr. Rice, following). The lemon was unknown to the early inhabitants of Greece and Rome, but it was mentioned in the 3d and 4th centuries A. D., in the *Book of Nabathæan Agri-*

Digitized by Google

culture. The use of the lemon as a grateful acid in drinks and cordials, as well as the peel of the fruit as a flavoring material in medicine, seems to have been known to primitive humanity. The introduction of the lemon parallels somewhat the record of the orange. Possibly the most authoritative dissertation on the lemon, which embodies the history of the citrus family generally, is that by Dr. Charles Rice, (548a), published in *New Remedies*, (467a), August, September and October, 1878. With his characteristic thoroughness, Dr. Rice gives in the body of his work and in numerous footnotes a world of information concerning the derivation of the name of each member of the citrus family used in commerce, together with the record of its products. From this we quote, as follows:

"*Lemon is from the Arabic limun* and this, by way of the Persian, is related to the Hindu *limu*, *limbu*, or *nimbu*. *Adam* already in his *Hindi-Kosha*, (Calcutta, 1829), translates the Sanskrit *nimbu* into Hindi *limu*. This translation is no doubt correct, but the Sanskrit has evidently coined or adopted the word from the North Indian vernaculars. In Cashmeer it is still called *nimbu*. There are many names in Sanskrit for the Citrus-fruits, a number of them standing for lemon. The *Madanavinoda* (see *New Remedies*, Aug. 1878, p. 231), (467a), mentions two kinds of *nimbu* (or nimbuka), one of which is sour, and the other sweet. Another native term is *nisbu*, according to the *Sabdakalpadruma*. The Medievo-Greek is *leimonion lemone*. The lemon is first mentioned in the book on Nabathæan Agriculture, under the name *hasia* (see *Meyer, Gesch. d. Bot.* III, (68)."—*Dr. Charles Rice, New Remedies, Sept.*, 1878.

Digitized by Google

LINUM

Official, in all editions, from 1820 to 1910.

Flaxseed, or linseed, *Linum usitatissimum*, has been cultivated from all times in the Old World. From natural scattering of its seeds it may become a weed, and is thus found wild in more or less favored locations throughout the temperate and tropical regions of the globe. Flax as a fibrous plant has been utilized throughout the journey of human civilization. The Egyptian tombs carry paintings illustrating the weaving of flax into cloth; the grave clothes of the early Egyptians were made of flax, whose record has been traced back to at least 2300 B. C. The seeds of the plant have ever been employed, both as a food and as a medicine. All the early historians, such as the Greek Alcman of the 7th century B. C., Thucydides and Pliny (514), refer to its qualities as a food, reciting that the seeds were used by the people, both externally and internally, as medicines. Charlemagne promoted the growth of flax in Northern Europe. The plant reached Sweden and Norway from its native land, before the 12th century.

LOBELIA (Lobelia, Indian Tobacco)

Official, all editions, from 1820 to 1910.

Lobelia, or Indian tobacco, *Lobelia inflata*, was introduced by Samuel Thomson (638) in the beginning of the 19th century. It has been, in domestic medication, in the practice of the Thomsonians and also of the Eclectics, one of the most valued remedial agents of the American flora (388b). Following its empirical use, the first printed record concerning its emetic properties is by the Rev. Manasseh Cutler, LL.D., (178), who in the *American Academy of Science*, 1785, under the title

Digitized by Google

"Account of Indigenous Vegetables," mentions Lobelia under the name emetic weed. Following this, Schöpf (582), 1787, incorrectly ascribed to it astringent properties, stating that it was used in ophthalmia, evidently confusing the properties of *Lobelia inflata* with those of its relative, *Lobelia syphilitica*. The Indians of North America employed lobelia when necessity required, as a substitute for tobacco. The writer of this historical study observed a very interesting ceremony among the Moqui Indians on their reservation in which a council (circle) of old men passed the pipe after each address or speech. The material smoked was a broken leaf mixture, seemingly a form of lobelia. The statement of Lewis and Clarke (381a) to the effect that the Chippewas used the root of lobelia, refers evidently to the root of *Lobelia syphilitica*, no record concerning the use of *Lobelia inflata* by the Indians being found in such publications as the *Book of the Indians*, 1837, by Drake (198). Nor was it named in *Indian Medicine*, by Browne, (104), (edited by W. W. Beach, 1877; Long's (393) account of the medicine and practice of the Indians of the West, 1819; nor by Nuttall, (477), who informed Dr. Mattson (415) that he had never known the Indians to use *Lobelia inflata*. *Indian Captivities*, though prolific as concerns the customs of the Indians, ignores the drug, as is also the case with the *American Herbal*, by Samuel Stearns, M. D., (612), 1772, though in this reference is made to other species of lobelia. Neither Barton (43) nor Rafinesque (535) mentions *Lobelia inflata*, from personal experience, as an Indian remedy. Catlin (131a) in his *Manners, Customs, and Condition of the North American Indians*, omits all mention of lobelia. However, Mattson, (415), 1841, in his

Digitized by Google

American Vegetable Practice, states that "there is abundant traditionary evidence that lobelia was used by the Penobscot Indians long before the time of Dr. Samuel Thomson, its reputed discoverer, but with the exception of that tribe, I have not been able to discover by any researches I have made that the American aborigines had any knowledge of its properties or virtues." Samuel Thomson, (638), whose name is so closely linked with that of lobelia as never to be dissociated therefrom, says, "It has never occurred to me that it was of any value in medicine until this time (1793)," and also, "In the fall of 1807, I introduced lobelia, tinctured in spirit as a remedy in asthma." Mattson, however, 1841, insists that its use by the people of New England was long before Thomson's time, reciting that "Mr. Phillip Owen, now eighty years old, relates that when a boy he was sent into the field by his mother to collect some lobelia for a child sick with quinsy, and that the herb, administered in the usual manner, afforded speedy and entire relief." The publication in which this occurs, dated 1841, shows that lobelia was a domestic remedy in 1770. Other evidence, (see *Drugs and Medicines of North America*, pp. 83-89), (389), indicates conclusively that lobelia was a domestic remedy with the settlers of North America before the day of the noted empiricist, Samuel Thomson, who, however, gave to it the conspicuity it has enjoyed for over a hundred years. The writer of this historical record is of the opinion that lobelia will yet be shown to be one of the most valuable of all the vegetable remedies native to America. Very much does its professional record remind of cinchona.

In 1885 a historical and illustrated study of lobelia was made by J. U. and C. G. Lloyd in the publication

Digitized by Google

"*Drugs and Medicines of North America*," pp. 63 to 97, in which was included special contributions by Doctors Scudder, Hale and Bartholow on its therapeutic uses. That of Bartholow was mainly devoted to its physiological action, being the first careful study in this direction. Believing in the importance of this much neglected American drug, we reproduce herewith the references cited in *Drugs and Medicines of North America* as being among the most important:[1]

Important Pharmaceutical and Medical References to Lobelia (Chronological)

1785.—Indigenous Vegetables, Cutler, p. 484, from Am. Journal Science and Arts.
1787.—Materia Medica Americana, David Schöpf, Erlanger (Germany), p. 128.
1792.—Medical Botany, Woodville, Vol. II, p. 249 (Lobelia syphilitica).
1793.—Domestic Medicine, William Buchan, Edinburgh, p. 513.
1798.—Collections for a Materia Medica of the United States, B. S. Barton, part first, (3d edition, 1810), p. 36.
1808.—The Pharmacopœia of the Massachusetts Medical Society, Boston, 1808.
1810.—The American New Dispensatory, Thacher, p. 146, (and other editions).
1811.—The American Lexicon, (author not named), New York. This is simply an imitation of Quincy; this paper being copied verbatim.
1817.—Therapeutics and Materia Medica, Chapman, p. 272, (and other editions).
1817.—Vegetable Materia Medica, W. P. C. Barton, Vol. I, p. 181.
1818.—The American Dispensatory, Coxe, p. 329 (and other editions).
1820.—The House Surgeon and Physician, Hand.
1820.—Pharmacopœia of the United States, p. 40.
1820.—Medical Dictionary, Hooper, (and other editions).
1821.—A Supplement to the Pharmacopœia, London, p. 73.
1822.—New Guide to Health or Botanic Family Physician and subsequent editions as well as other publications by the author, Samuel Thomson.

[1] In planning this history of drugs, the question arose as to whether references should follow each article, or be placed after the work and indicated by numbers in the text. The latter plan was selected to save space. The articles on lobelia and cinchona indicate what others would have been.

Digitized by Google

1822.—Materia Medica and Therapeutics, Eberle, Vol. I, p. 63.
1826.—A Materia Medica of the United States, Zollickoffer, pp. 155, 167, 194, 198, 209, 212.
1828.—Materia Medica and Pharmacy, Murray, p. 183, (and other editions).
1829.—Manual of Materia Medica and Pharmacy, Edwards and Vavasseur, pp. 262, 362.
1830.—The Botanic Physician, Smith, p. 475.
1830.—Introduction to the Natural System of Botany, Lindley, p. 187.
1830.—Pharmacopœia of the United States, Philadelphia, p. 15.
1830.—Pharmacopœia of the United States, New York, p. 43.
1832.—An Improved System of Botanic Medicine, Howard, Vol. II, p. 337, (and other editions).
1833.—A Narrative of the Life and Medical Discoveries of Samuel Thomson, (various references).
1833.—Prodrome of a work to aid the teaching of the Vegetable Materia Medica, W. P. C. Barton, p. 60.
1833.—New Guide to Health, Samuel Thomson, p. 46, (various other references). This is the tenth edition. The copyright was obtained in 1822.
1833.—American Journal of Pharmacy, p. 282.
1833.—United States Dispensatory, (and subsequent editions).
1833.—The American Practice of Medicine, Beach, Vol. III, p. 120.
1833.—The Eclectic and Medical Botanist, (a Journal printed in Columbus, Ohio), p. 340.
1833.—The Thomsonian Recorder, Vol. I, pp. 254, 516.
1834.—American Journal of Pharmacy, p. 300.
1834.—The Thomsonian Recorder, Vol. II, pp. 119, 199, 200.
1834.—Medical Botany, Sanborn, p. 105.
1835.—The Thomsonian Recorder, pp. 3, 4, 91, 150, 155, 177, 209, 253, 283, 284, 288, 318, 380, 412, 414.
1836.—General Therapeutics, Dunglison, pp. 229, 230, (and other editions).
1836.—The Thomsonian Recorder, pp. 145, 205, 247, 283, 359, 405.
1836.—The Western Medical Reformer, pp. 104, 207, 374.
1837.—The Thomsonian Recorder, pp. 192, 199, 252, 292, 315, 330, 334, 384, 388, 402.
1837.—The Western Medical Reformer, pp. 126, 189.
1838.—American Journal of Pharmacy, p. 98.
1838.—The Botanico-Medical Reformer, pp. 26, 61, 72, 80, 100, 102, 118, 128, 134, 138, 142, 163, 189, 206, 211, 227, 234, 236, 238, 299, 305, 400.
1838.—The Southern Botanic Journal, pp. 36, 77, 153, 248, 253, 354.

Digitized by Google

1839.—Lobelia Advocate and Thomsonian Medical Recorder, by Rev. John Rose.[1]
1840.—Pharmacopœia of the United States, pp. 25, 214.
1840.—American Journal of Pharmacy, p. 280.
1840.—Pharmacopée Universelle, Jourdan, p. 802.
1840.—Elements of Materia Medica, Pereira, Vol. II, p. 385.
1841.—The Thomsonian Materia Medica, Thomson, p. 581.
1841.—American Journal of Pharmacy, p. 1.
1841.—The Botanico-Medical Reformer, p. 168.
1841.—New Remedies, Dunglison.
1841.—American Vegetable Practice, Mattson, Vol. I, pp. 160 to 174, 312, 317, 404.
1842.—The Botanico-Medical Reformer, pp. 47, 88, 177, 198, 203.
1842.—American Journal of Pharmacy, p. 4.
1842.—A Treatise of the Materia Medica and Therapeutics, Eberle, p. 67.
1842.—Botanic Theory and Practice of Medicine, Worthy, pp. 594, 611, 620, 627.
1843.—Pharmaceutisches Central-Blatt, No. 31, July 5th.
1843.—General Therapeutics and Materia Medica, Dunglison, Vol. I, p. 121; Vol. II, p. 197.
1843.—American Journal of Pharmacy, p. 108.
1844.—The Sick Man's Friend, Sanborn, pp. 96, 243.
1844.—Medicines, Their Uses and Mode of Administration, Neligan, p. 215.
1844. Botanico-Medical Recorder, pp. 252, 237, 372.
1845.—Botanico-Medical Recorder, p. 162.
1845.—The Practice of Medicine on Thomsonian Principles, Comfort, p. 441.
1845.—Elements of Materia Medica and Therapeutics, Harrison, Vol. II, p. 447.
1846.—The Medical Formulary, Ellis, p. 46.
1846.—Botanico-Medical Recorder, pp. 74, 77, 259.
1847.—Materia Medica and Therapeutics, Royle, (by Carson), p. 456.
1847.—Family Flora and Materia Medica Botanica, Good, plate 27.
1847.—Botanico-Medical Reference Book, Biggs, pp. 500, 586, 588.
1847.—The American Practice, Beach, (and other editions), p. 661.
1847.—Medical Botany, Griffith, p. 418.
1848.—Medicinal Plants of New York, Lee, p. 35.
1848.—Mayne's Dispensatory and Formulary, pp. 56, 159, 204.
1848.—Medicinal Plants of South Carolina, p. 785.

[1] This unique publication was issued monthly in the interests of the lobelia practice, during the year 1839. It was not supported, and only one volume appeared. We are indebted to Dr. Charles Rose for this volume complete, probably the only copy in existence. In its front is bound the "Trial of Dr. Frost." We do not refer to pages in this work, its title showing that the entire subject is connected with lobelia.

Digitized by Google

1849.—Elements of Materia Medica and Therapeutics, Kost, pp. 78 to 86, 198, 227, 487.
1850.—Pharmacopœia of the United States, pp. 29, 250.
1850.—Pharmaceutical Journal and Transactions, (Vol. X), p. 270.
1850.—The Physio-Medical Recorder and Surgical Journal, p. 183.
1850.—Medicinal Plants of the United States, Clapp, (Am. Med. Report), pp. 807 to 809.
1851.—Pharmaceutical Journal and Transactions, pp. 270, 561.
1852.—The Eclectic Dispensatory, King and Newton, p. 246.
1853.—Principles of Scientific Botany, Bickley, p. 175.
1854.—Eclectic Medical Journal, Cincinnati, p. 312.
1854.—An Improved System of Botanic Medicine, Howard, pp. 328-338.
1854.—The Elements of Materia Medica or Therapeutics, Pereira, (Carson's edition), Vol. II, pp. 583 to 587.
1855.—The Middle States Medical Reformer, pp. 1 to 4, 44.
1857.—Druggist's Circular, p. 158.
1857.—Materia Medica and Therapeutics, Mitchell, p. 567.
1859.—Domestic Medicine, Kost, pp. 307, 362, 366, 380, 383, 437.
1860.—Pharmacopœia of the United States, pp. 34, 331.
1861.—Book of Formulæ, Tilden & Co., p. 73.
1864.—Therapeutics and Materia Medica, Stillé, p. 280.
1864.—Eclectic Medical Journal, Cincinnati, p. 141.
1865.—American Journal of Pharmacy, p. 211.
1865.—Proceedings American Pharmaceutical Association, p. 211.
1866.—American Eclectic Materia Medica and Therapeutics, Jones & Scudder, pp. 13, 112, 113, 235, 675.
1867.—Eclectic Medical Journal, Cincinnati, p. 269.
1869.—Eclectic Medical Journal, Cincinnati, p. 237.
1870.—Pharmacopœia of the United States, pp. 36, 63, 313.
1870.—Eclectic Medical Journal, Cincinnati, pp. 206, 400, 445, 476.
1871.—Botanical Survey of Louisiana, Featherman, p. 96.
1871.—Eclectic Medical Journal, Cincinnati, pp. 10, 145.
1872.—American Journal of Pharmacy, p. 293.
1872.—Pharmacopœia Homeopathica Polyglotta, pp. 106, 190.
1872.—Druggist's Circular, p. 160.
1873.—Dictionary of Pharmaceutical Science, Sweringen, p. 253.
1873.—Druggist's Circular, p. 56.
1874.—Eclectic Medical Journal, Cincinnati, p. 46.
1875.—Hale's New Remedies, Vol. II, p. 416.
1875.—On Poisons, Taylor, p. 735.
1875.—American Journal of Pharmacy, p. 127.
1875.—Boston Medical and Surgical Journal, Feb. 4th.
1875.—Druggists Circular, p. 66.
1876.—New Remedies, Wm. Wood & Co.
1876.—Eclectic Medical Journal, p. 125.
1876.—Journal of Materia Medica, Bates & Tilden, p. 103.

Digitized by Google

1877.—Encyclopædia of Pure Materia Medica, Allen, Vol. V, p. 611.
1877.—American Journal of Pharmacy, p. 588.
1877.—The Pocket Formulary, Beasley, p. 237.
1877.—Pharmaceutical Journal and Transactions, p. 958.
1877.—New Remedies, Wm. Wood & Co., p. 366.
1877.—The New Materia Medica and Therapeutics, Goss, pp. 17, 31.
1877.—Eclectic Medical Journal, Cincinnati, pp. 290, 578, 579.
1878.—American Journal of Pharmacy, p. 254.
1878.—Eclectic Medical Journal, Cincinnati, p. 78.
1878.—Pharmaceutical Journal and Transactions, London, p. 561.
1878.—Organic Constituents of Plants, Wittstein, p. 122.
1878.—Dispensatory and Pharmacopœia of North America and Great Britain, Buchanan & Siggins, pp. 194, 196, 574.
1878.—New Remedies, Wm. Wood & Co., pp. 21, 84.
1879.—Pharmacographia, Flückiger & Hanbury, p. 400.
1879.—National Dispensatory, (and subsequent editions), p. 859.
1880.—Pharmacopœia Homœopathica, Polyglotta, p. 222.
1880.—Pharmacopœia of the United States, pp. 8, 131, 211, 349.
1880.—Therapeutic Gazette, pp. 34, 94.
1882.—New Remedies, Wm. Wood & Co., p. 240.
1882.—Druggists' Circular, p. 158.
1884.—Plant Analysis, Dragendorff, (Greenish's Translation), pp. 50, 202.
1885.—Materica Medica and Therapeutics, Bartholow, p. 583.
1886.—American Journal of Pharmacy, p. 392.

"We do not consider it necessary to mention all the important works that refer to this plant and its compounds. Since 1809 medical publications of every description have continually mentioned the plant, and medical references are innumerable. In order to arrive at a correct understanding of the subject, we made comparative studies of the record as found in the preceding works, and have found other publications to present few additional facts. We may safely say that the lobelia history may be studied as intelligently in these as by the aid of additional numberless works that mention the plant."—Editors, *Drugs and Medicines of North America.*

Digitized by Google

LYCOPODIUM (Lycopodium)

Introduced into *U. S. P.* 1860. Official in all later editions, including 1910.

From the beginning of recorded time the minute spores of *Lycopodium clavatum* (and other species), known also to the early botanists as *Muscus terrestris*, or *Muscus clavatus*, have been commended for their therapeutic virtues. This plant, the common club moss, is found throughout Central and Northern Europe, Russian Asia, Japan, North and South America, the Falkland Islands, and even to the Cape of Good Hope, being so widely distributed as to have led, naturally, to its therapeutic use in common life, in all parts of the world. The spores of lycopodium have been used in domestic therapy as an application to fresh wounds, and have thus a reputation as an absorbent styptic. Official in pharmacy in the middle of the 17th century, the English druggists seem not to have included the powder in their list of drugs before 1692, nor has it been official in any of the London Pharmacopeias. Lycopodium is much employed in Homeopathic and Eclectic medication. In connection with shellac and earthy salts, it is also used in large quantities in the making of different colored signal fires, as well as for color displays for evening celebrations.

MALTUM (Malt)

Official only in 1880, 1900 and 1910. Malt is derived from the grain of one or more varieties of *Hordeum sativum* (*Hordeum distichon*, *U. S. P.* 1900) or Barley.

The time of the introduction of malt antedates the lore of systematic medication. Germinated barley, kiln-dried, has been used in the mak-

Digitized by Google

ing of malted liquors since a very early date, and malt liquors have been in domestic use, both as a beverage and an extract, for a very long period. The introduction of malt into the Pharmacopeia resulted from the empirical use of the semi-proprietary "Extracts of Malt," which a few years after the middle of the last century became popular in domestic as well as in professional use. Its introduction to medicine is, however, (as with many other substances, of merit or otherwise), due largely to the efforts of manufacturing pharmacists.

MANNA (Manna)

Official in all editions of the *U. S. P.*, from 1820 to 1910.

Biblical manna was a food that sustained the Israelites in the wilderness (Ex. xvi:14-36; Numbers xi:6, 7). It was believed to be of miraculous origin, as though falling from Heaven.

> "Each morning, on the ground,
> Not common dew, but *Manna* did abound."

Sylvester, tr. of Du Bartas' *Weeks*, ii. Eden (*Cent. Dict.*)

That the idea of a miraculous, heaven-supplied food is not even yet considered irrational, is shown in our study of *American Manna* (pp. 194, 195).

"In an official report received today, Consul Heizar states that manna is found now in the regions of Upper Mesopotamia and Kurdistan, and along the Persian frontier. It falls, he says, in the form of dew during September, October, and November. It is eaten by the natives." (*New York Times*, March 23, 1921.) To this we will add that a twenty-four hour sand storm that we met in Egypt in 1906, not far from the place where Moses is said to have led the Israelites across

Digitized by Google

the Red Sea, left the earth *covered with live lady bugs*. The nearest wooded land from the storm's direction, a thousand or more miles, was African Abyssinia. A lichen (*manna lichen*) is said likewise to be carried "vast distances," and is eaten where it "falls from heaven."

Manna of commerce is supplied by the manna ash, *Fraxinus Ornus*, of the Southern Tyrol, Italy, Switzerland, Asia Minor, and the mountainous islands of the Mediterranean and countries adjacent. In Central Europe it grows as an ornamental tree, the foliage exhibiting great variation in shape of leaflets, and the fruit being diverse in form. According to Flückiger and Hanbury, (240), previous to the 15th century the manna of Europe was imported from the East, and was not derived from the manna ash. Manna in early days was a natural exudate, much scarcer than at present, and much more expensive. The increase in production, now artificially maintained, has lessened the price, but at the expense of quality. During the 16th century the plan was devised of artificially producing a more copious supply of the gum by incising the trunk and branches, and this method gradually became predominant, although it was strenuously resisted by legislative enactments. The name *Gibelmanna, manna mountain*, by which an eminence of the Madonian range of mountains in Sicily is known, indicates that this mountain furnished manna during the days of the Saracens in Sicily. Manna has been used as a domestic remedy from all times as a gentle laxative. It is supposed, in domestic medicine in this country, to modify the griping qualities of a mixture of senna and jalap. Its domestic use in America came through European home medication.

Digitized by Google

When Professor Flückiger visited America, July, 1894, he hoped to obtain historical data that would enable him to give the records of several interesting American productions. Failing in this, he associated in his behalf the writer, who agreed to furnish the historical record of these drugs, Dr. Flückiger assuming their chemical responsibility, after the manner of Flückiger and Hanbury's *Pharmacographia*. After a few papers on American drugs had been contributed by the writer, the work was interrupted by the death of Dr. Flückiger. His papers passed into the possession of Professor Ed. Schär, of Strasburg University, who translated several of the writer's contributions into the German, for the pages of *Berichte der deutschen pharmaceutischen Gesellschaft*. The original of one of these, on the subject of the American, or California manna, appeared in the *American Journal of Pharmacy*, July, 1897. This we present in full, as properly belonging to the subject of manna, which would otherwise be incomplete.

AMERICAN MANNA (The California Manna)

MENTIONED BY FATHER PICOLO. (*With a summary.*)

Query by Prof. Flückiger:

"What was the manna mentioned by one Father Picolo[1] in California and alluded to by Proust, in *Ann. d. Chim.*, 57 (1806), p. 145?

Answer by John Uri Lloyd.

DEAR PROF. FLÜCKIGER:—I find, on reference to the paper cited, that the statement is as follows:

Proust. *Ann. d. Chim.* 57, p. 145. On the Sugar of the Grape.

[1] "Picolo, François Marie, a Sicilian Jesuit, was born in Palermo, March 24, 1654, entered the Society of Jesus in 1673, and made the four vows in Mexico in 1689. He founded the Mission of Jesus of Carichic, where he resided for fourteen years, and afterwards united with Father Jean de Salvatierra in order to open the missions in California.

"After a stay of forty years with the missions, he received the reward of his toil on February 22, 1729."

Digitized by Google

The manna seems to abound in America, according to the reports of travellers. Herera says: "It falls in the season in the quantity of a dew, which congeals like sugar, and which is so wholesome that it is named Manna. Father Picolo, one of the first spiritual conquerors of California, assures us that it exudes in considerable amounts from the shrubs (arbrisseaux) in April, May and June.

It will be shown hereafter that this is not a literal abstract from the original source, where the word *roseaux* is used instead of the word *arbrisseaux*.

In tracing this subject, first the story of Father Picolo presents itself as follows:

WRITINGS OF FRANÇOIS MARIE PICOLO.[1]

Abstracted from Bibliothèque des Écrivains de la Compagnie de Jésus, Liège A. Lyon, 1872, p. 1957.

His writings, as far as known to me,[2] are contained in the following communication:

"Memoir, with regard to the conditions of the missions lately established in California, by the Fathers of the Society of Jesus; presented to the Royal Council of Guadalaxara, in Mexico, February 10, 1702, by Father François Marie Picolo, of the same society, and one of the original founders of this Mission."

This memoir of F. M. Picolo is reprinted literally in W. I. Kip's *Historical Scenes from the Old Jesuit Missions*, New York, 1875, which is an abstract of American topics from the following work:

"*Lettres Édifiantes et curieuses, écrites des Missions Étrangères, in 47 volumes, containing the letters of the Jesuit missionaries from about 1650 to 1750,*" this collection being purchased by W. I. Kip from the library of the Bishop of Durham.

Speaking in Chapter II, Missions in Lower California, 1702, he states, p. 57, "in the months of April, May

[1] Thanks are extended St. Xavier's College, Cincinnati, for library courtesies extended to Dr. Sigmond Waldbott, who made the translations that enabled us to present this study of manna.

[2] J. U. L.

Digitized by Google

and June, a kind of manna falls with the dew, which congeals and hardens on the leaves of the reeds[1] (*roseaux*) from which it is gathered. I have tasted it. It is a little darker than sugar, but has all its sweetness."

Endeavoring to identify Father Picolo's manna, the following reference to manna-like bodies (false mannas) was noted in the *U. S. Dispensatory*, 17th Ed., Philadelphia, 1894, p. 850, which, however, are not the same manna as that of Picolo.

"*American False Manna.* A substance resembling manna, of a sweet, slightly bitter, and terebinthinate taste, and actively purgative, exudes from incisions in *Pinus Lambertiana* of Oregon, and is used by the natives." (*Nar. of U. S. Expl. Exp.*, v. 232.)

"M. Berthelot has abstracted from this product a peculiar saccharine principle which he calls 'pinite.'" (See *Amer. Jour. Phar.*, vol. 28, p. 157.)

The strongly cathartic properties of this manna of the pinus and its resemblance to manna are emphasized in the following description of this substance:

I. Wilkes, *Narrative of the U. S. Exploring Exped.*, Philadelphia, 1850, Vol. 5.

P. 232. Speaking of the *Pinus Lambertiana*, which they found frequently when crossing the Umpgua Mountains in Southern Oregon. "Some of the sugar produced by this tree was obtained; it is of a sweet taste, with a slightly bitter and piny flavor; it resembles manna, and is obtained by the Indians by burning a cavity in the tree, whence it exudes. It is gathered in large quantities.

"This sugar is a powerful cathartic, and affected all the party who partook of it; yet it is said that it is used

[1] *Roseaux*, in the original Lettres édifiantes, etc., Tome V, p. 264, Kip's translation, is literal, as has been verified from the original letter.—J. U. L.

Digitized by Google

as a substitute for sugar among the trappers and hunters."

II. John S. Newberry, botanist in charge of the U. S. Pacific R. R. Surveys, California and Oregon. *Botanical Report*, 1855, p. 44. *On the Pinus Lambertiana, the Sugar Pine.*

"The resin of the sugar pine is less abundant than that of the *P. ponderosa;* is white or transparent like that of *P. strobus.*

"That which exudes from partially burnt trees, for the most part, loses its terebinthine taste and smell, and acquires a sweetness nearly equal to that of sugar.

"This sugar gives the tree its name, and is sometimes used for sweetening food. It has, however, decided cathartic properties, and is oftener used by the frontier men as a medicine than a condiment.

"Its resemblance in taste, appearance and properties to manna strikes one instantly; and but for a slight terebinthine flavor, it might be substituted for that drug without the knowledge of the druggist or physician, its physical and medical properties are so very like."

It is not possible that Father Picolo refers to the sugar from these trees, as he failed to record any cathartic properties as an attribute of his sugar; furthermore, the manner which he describes of collecting the sugar hardly conforms to the description just given as to the manner of collecting it from these trees. It is most probable, according to his brief statement on the subject (for he mentions it as occurring "on the leaves of the reeds"), that high trees carrying sugar in their sap are out of question, although such sugar trees were not

Digitized by Google

unlikely to have been met by him. For example, also, (*white maple, Acer macrophyllum*, see appended list of references, No. 8).

Only reed grasses are likely to come into consideration with the manna of Picolo, and of these we have recorded as follows:

(1) *Manna grass*, Glyceria. This seems to be out of the question, as text-books on botany (Gray, etc.) state that the name, denoting sweet, is given in allusion to the taste of the *grain*.

(2) *Phragmites communis, Trin.* Described by *U. S. Geological exploration of the 40th parallel.* C. King, 5th vol. Botany. S. Watson, p. 390.

"Found from Florida to Canada and westward to the Pacific. On the banks of fresh-water streams and springs from the Truckee to the East Humboldt Mountains, Nevada, 4–6000 feet altitude. Sugar is said by Durand and Hilgard[1] to be extracted from the stalks of this grass by the Indians, but the scanty juice is not at all saccharine.

"A sweet secretion, however, is sometimes formed upon it in considerable quantity by aphides, as well as upon the leaves of *cotton-wood* and *other trees*, and is collected by both the Utes and the Mormons."

If this is correct [there is no higher authority to be found than Sereno Watson], the "manna" observed to form on these plants is the secretion of an insect and *not* an exúdation from the plant. *Phragmites communis*, thus far, comes nearest the plant described by Father Picolo.

All the plants cited before were found to occur in locations altogether different from the locality where

[1] *Pacific R. R. Surveys, Bot. Rep.* By Durand and Hilgard, Washington, D.C., 1855, p. 15.

Digitized by Google

Father Picolo made his observations, which does not, however, preclude them from his territory.

Father Picolo's range of observation never extended north of Lower California, and, on the other hand, the information we have of this California (which is really a part of Mexico) is rather scant.

The following publications present two sources of information on Lower California:

First: J. Ross Browne, *Resources of States and Territories West of the Rocky Mountains*, New York, 1869, with an appendix, p. 630, on Lower California, and with an historical addition, a *Sketch of the Settlement and Exploration of Lower California*, by Alex. S. Taylor.

Description of Lower California by J. Ross Browne, contains the following passage:

Page 637, "Fields of sugar cane are too common to excite remark, and the manufacture of sugar is one of the most important interests of the southern part of the peninsula. . . . The cane fields extend as far as the eye can reach from San José." (This place is situated at the extreme southern coast.) "Sugar mills in Comondu . . . sugar exported in Purisima." This does not refer to the manna under discussion, and it will be mentioned later that this sugar cane is not indigenous, but was imported by later settlers.

Second: *Enclyclopædia Britannica, ninth ed.* On California; makes mention of Lower California also, introducing it as follows:

"The interior of Lower California is chiefly known to us as to its physical and geological structure, from a reconnaissance made by Messrs. Gabb and Loehr of the State Geological Survey of California, in 1867.

Digitized by Google

This exploration was set on foot in order that some information might be obtained relative to the value of a concession made by the Mexican Government to an American company. This grant was expected to lead to a settlement of the country, but the whole thing turned out a failure."

The work referred to, *The State Geological Survey of California in 1867 in charge of Messrs. Gabb and Loehr*, is unfortunately not at our command. It may possibly name that "reed" which yielded sugar, as observed by Father Picolo.

However, the first-named book, by J. Ross Browne, in its second part, *A Sketch of the Settlement and Exploration of Lower California*, by Alex. S. Taylor, that appeared in 1869, makes mention of the exploration of Lower California that had taken place in 1867 by Messrs. Gabb and Loehr, under the direction of Mr. J. Ross Browne, the results of which, however, were not then published.

Mr. J. Ross Browne, however, gives a general outline of this exploration, based on detailed letters he received from Mr. Gabb while on his exploring tour.

P. 66, a description of vegetation in Lower California is given, which may be condensed as follows:

"*Agaves* (century plant) are also abundant, may be useful in the future to extract spirits from the root. . . . *Acacias*, palms with edible fruits, coniferæ, oaks, wild plums, cottonwoods, sycamores, willows, elder. The Arabian date palm, introduced by missionaries, is thriving. The sugar cane has been cultivated for more than a century, and yields a sugar as strong and as sweet as that of Peru, and very abundant in juice."

P. 82. Letter of Mr. Gabb to Mr. J. Ross Browne,

Digitized by Google

May, 1867: "At Santiago there are extensive plantations of sugar cane, and a sugar mill was in active operation. The process throughout is of the most primitive kind, but the result is a very palatable sugar moulded into cakes somewhat like maple sugar, and known as panoche." "Sugar industry . . . also at Todos Santos."

P. 143 of J. Ross Browne, Sketch and Settlement of Lower California. *Report of Dr. John A. Veatch on Carros or Cedros Island*, p. 152, *Soil and Productions*, pine trees.

"The two interesting species of *Rhus* (*R. Lentiana* and *R. Veatchiana*) form marked features in the island flora, the former for the delicious acid exudation of its fruit." . . .

"A beautiful, yellow-flowered agave or aloe plant, about 12 feet in height, with a stem from 4 to 6 inches diameter at the base, branching and spreading at the top and terminating in a profusion of golden blossoms, was tolerably abundant. The flower cups were filled with a fragrant, sweet liquor."

The same book of J. Ross Browne points to a third source of information on Lower California; this, however, was not obtainable in the original.

P. 155, *Extracts from a History of Old or Lower California*. A posthumous work written originally in Spanish by Padre Franc. Jav. Clavijero,[1] of the Society of Jesus. Translated into Italian, Venice, 1789, and back again into Spanish by Nicolas Garcia de San Vicente

[1] *Biography of Francis Javier Clavijero.* Taken from Bibliothèque de la Compagnie de Jésus. Tome II, Bruxelles and Paris, 1891, p. 1210.

Francisco Javier Clavijero, born in Vera Cruz, on the 9th of September, 1731. Was received in the province of Mexico, February 13th, 1748. He taught rhetoric in Mexico, philosophy at Valladolid and at Guadalaxara in New Spain. He was exiled and deported to Italy, and died at Bologna, April 2d, 1787.

Historia de la Antigua a Baya California. Obra posthuma del padre Francisco Javier Clavijero de la compania de Jesus.

Digitized by Google

(Juan R. Navarro, editor), 1852, was translated into English by A. G. Randall, Secretary and Translator of the Lower California Company's Exploring Expedition, San Francisco, May, 1867.

P. 164 of J. Ross Browne's Book, *loc. cit.*, says, as bearing on our subject:

"In some parts there grows, near running streams, reed grass, of the thickness of the little finger.

"THIS LITTLE REED IS THE ONLY PLANT IN CALIFORNIA IN WHICH MANNA IS FOUND. At the present time there are large growths of this imported from abroad."

[NOTE.—Some time after this paper was placed in the hands of Professor Flückiger, the following information was found in the Lloyd Library, and a copy at once forwarded to Prof. Ed. Schär, Strasburg, for the purpose of supplementing the present paper.

From the U. S. Agricultural Report for 1870, *Food Products of the North American Indians*, p. 423, "Bent grass (*Arundo Phragmites*)" (which is a synonym for *Phragmites communis*, Trin.).

"This species of reed, which grows abundantly around St. Thomas, in southern Utah, during the summer months, produces a kind of white, sweet gum. The Utah Indians cut down the reeds and lay them in piles on blankets or hides, and let them remain for a short time to wilt, when the bundles are beaten with rods to release the gum. The small particles so detached are pressed into balls to be eaten at pleasure."

Digitized by Google

SUMMARY

Sugar and two kinds of "manna" are described in Western literature.

1st, *Sugar*. Sugar was derived from the sugar cane, which was introduced into Lower California at least one hundred years ago. This was not "manna."

2d, *Father Picolo's Manna*. Father Picolo observed a saccharine deposit on a species of grass that he called reeds (*roseaux*) and not shrubs (*arbrisseaux*) as Proust recorded the word. Of the plants likely to have yielded this manna, the *reed grasses* only are to be considered. Of the reed grasses, *Phragmites communis* undoubtedly answers all the conditions that are cited by Father Picolo. This manna is still collected by the Indians.

3d, *Manna of the Pinus*. This is yielded by *Pinus Lambertiana* of Oregon, and is cathartic as well as sweet, but no evidence exists to indicate that Picolo had any knowledge of its existence.

Finally, I would decide that without question Father Picolo described, as he saw it, the saccharine deposit on *Phragmites communis*, which, according to Watson, is caused by aphides.[1]

REFERENCES ON THE SUBJECT OF FATHER PICOLO'S MANNA.

(1) PROUST, *Ann. d. Chimie*, 57 (1806), p. 145, mentioning Father Picolo and his manna; this occurring on "arbrisseaux" shrubs.

(2) *Bibliothèque des Ecrivains de la Compagnie de Jésus*, Liège and Lyon, 1872, p. 1957. Biography of Father Picolo, and mentioning his "Memoir."

(3) *Lettres édifiantes et curieuses, écrites des Missions étrangères*, in 47 volumes, containing the letters of the Jesuit missionaries from about 1650-1750. Translated from the Spanish, Vol. V,

[1] Probably the greater part, if not all, of the manna that collects on the green leaves of trees, is produced by certain insects (plant lice or aphids). These insects form manna as the waste product of digestion. It is secreted in small, transparent globules, which give to the leaves to which they adhere a glabrous appearance. The liquid is often so abundant as to rain down upon the sidewalks underlying, in sufficient quantity as to adhere to the feet of pedestrians. To the entomologist this manna is known as "honey-dew." Domestic bees eat and store away this manna, but it makes an inferior quality of honey. Colonies of bees whose food during the winter is honey-dew honey do not thrive, and are said to be susceptible to "foul brood". Honey-dew is very common, on a great variety of trees.—*J. T. Lloyd.*

Digitized by Google

p. 264. Containing the memoir of Father Picolo, mentioned under 2 in French, manna occurring on "roseaux" reeds.

(4) W. I. KIP, *Historical Scenes from the old Jesuit Missions*, New York, 1875, p. 50. Containing the "memoir" of Father Picolo, literally translated into English.

(5) *U. S. Dispensatory*, seventeenth edition, Philadelphia, 1894, p. 850. On American False Manna. From *Pinus Lambertiana*, Sugar Pine. Points to Reference No. 6.

(6) WILKES, *Narrative of the U. S. Exploring Expedition*, Philadelphia, 1850, Vol. V, p. 232. On *Pinus Lambertiana*. The sugar has strongly cathartic properties.

(7) JOHN S. NEWBERRY, botanist in charge of the U. S. Pacific R. R. Surveys in California and Oregon, 1855. *Botanical Report*, p. 42. Describing *Pinus Lambertiana* and corroborating statement in Reference No. 6.

(8) J. G. COOPER, botanist in charge of the U. S. Pacific R. R. Survey Route near the 47th and 48th parallels, explored by I. I. Stevens, 1853-55. *Botanical Report*, No. 1, p. 28. Mentions *White Maple, Acer macrophyllum*, as containing sugar in its sap.

(9) ASA GRAY and others. *Botany*. Manna grass, sweet principle is contained in the grain.

(10) SERENO WATSON, botanist in charge of U. S. Geological Exploration of the 40th parallel, under C. King, 5th Vol., *Botany*, p. 390. On *Phragmites communis*. Reed-sap not saccharine. Aphides cause sweet secretions on its leaves and those of cottonwood and other trees.

(11) DURAND AND HILGARD, Pacific R. R. Survey. *Botanical Report*, Washington, D. C., 1855, p. 15. The Indians are said (by D. and H.) to extract sugar from *Phragmites communis*. This seems to be contrary to the statement in Reference 10.

(12) J. ROSS BROWNE. *Resources of States and Territories west of the Rocky Mountains*, New York, 1869, (*a*) with an appendix, p. 630, on Lower California, and with an historical addition, (*b*) A sketch of the settlement and exploration of Lower California, by Alex. S. Taylor. In 12 (*a*) it is mentioned that sugar cane abounds in Lower California; 12 (*b*) contains further references.

(13) *Encyclopædia Britannica*, 9th ed. On California, also on Lower California, points to Reference No. 14.

(14) GABB AND LOEHR, with the State Geological Survey of California in 1867. The original was not accessible. A brief excerpt is contained in Reference 12 (*b*), p. 66.

(15) Report of JOHN A. VEATCH, *On Carros or Cedros Island*. Original not accessible. Brief excerpt is to be found in Reference 12 (*b*), p. 152. Mentions an "agave," which contains a sweet liquid in its flowering cups.

Digitized by Google

(16) *Extracts from a History of Old or Lower California.* A posthumous work, written originally in Spanish by *Padre Franc. Javier Clavijero*, of the Society of Jesus. Translated into Italian, Venice, 1789, and back again into Spanish by Nicolas Garcia de San Vicente (Juan R. Navarro, editor), 1852. Was translated into English by A. G. Randall, Secretary and Translator of the Lower California Company's Exploring Expedition, San Francisco, May, 1867. Original not accessible. An abstract to be found in 12 (*b*), p. 164. It states that there is a reed growing in Lower California near running streams that yields manna.

MARRUBIUM (Horehound)

In all the early editions, Marrubium occupied a place in the Secondary List, not being promoted to the Primary List until 1860. It was official until 1900, but was dropped in 1910.

Horehound, *Marrubium vulgare*, is indigenous to Europe, but has been naturalized in America, where it is now very common. Its use as a bitter decoction led to its early introduction into domestic medicine, as well as to its popular use as a bitter flavor in candy. Probably the well-known "horehound candy" may be cited as a domestic medicine that has become popular as a confection. The date of the use of horehound as a sweetened tea must have been very early in the records of European home medication.

MASTICHE (Mastic)

First mentioned in *U. S. P.* of 1860. Remained official until (including) 1900. Dropped in 1910.

Mastic, *Pistacia Lentiscus*, is an evergreen shrub, native to the Mediterranean shores, from Syria to Spain, being found also on the adjacent islands as far as the Canaries. The collection of mastic, however, is localized to the northern part of the island of Scio, where from all time the tree has been known, exuding most abundantly the resinous tar that, when dried, is known as mastic. The origin of its use is lost in an-

Digitized by Google

tiquity. Theophrastus (633), 4th century B. C., mentions it, and both Dioscorides (194) and Pliny (514) refer to it in connection with the island of Scio, or Chios. The writer, during a journey to the Orient in 1906, made a study of mastic, his description, written in Smyrna, being as follows:

HISTORY.—The island of Scio, or Chio, lies in the Mediterranean Sea about six hours by steamer from Smyrna. It has long been celebrated, in that a pocket of the northern part furnishes the world's supply of mastic which is not produced by the adjacent islands, notwithstanding their fertility, and their favorable situation as concerns exposure and climate.[1] But that the tree will thrive elsewhere, is shown by the fact that a photograph taken by the writer, of a mastic tree in the garden of Mr. Alfred A. Keun, near Smyrna, exhibits the tree dripping (May 6, 1906), with the transparent, brilliant tears. In the island of Chio, one district is called *Mastikohoria*, meaning, "Village Producing Gum Mastic," and from this district, the world is supplied with its mastic.

Mastic, like other Oriental gums, resins and balsams, has been known from antiquity, Theophrastus, (4th Century B. C.), Dioscorides and Pliny recording it as a product of Chio. It was formerly of great importance, as indicated by the following record. (See *Pharmacographia*, by Flückiger and Hanbury).

In the Middle Ages, the mastic of Scios was a monopoly of the Greek Emperors. The successor of Andronicus II, 1304, gave the mastic concession to a rich Genoese named Benedetto Zaccarias, whose family

[1] The circumscribed areas of sections producing certain drugs, fruits and natural products, is noticeable enough to warrant a special paper on the subject of such limitations in the Orient.

Digitized by Google

proceeded to rebel against the Emperor, becoming sovereigns of Scio. Subdued by Andronicus III, the island was retaken, 1346, by the Genoese, a company called the Giustianiani being formed to do "mastic" and other business. This company was very rich, comparing with the famous East India Company, having its own mint, constitution and government, and even engaging in wars with the Turks. Severe was their law concerning mastic, cruel their punishment of intruders or offenders. In 1566 the Turks captured the island, which since that date has been under Moslem rule. The tribute they levied on the inhabitants was that the ladies of the Sultan's harem should be supplied, free of all expense, with all needed supplies of the choicest mastic. On account of its mastic, the little island of Chio has, from the earliest days, been a center of Oriental interest, but owing to the waning importance of mastic it has lost its former prestige, though it is still famed for its resin.

DESCRIPTION.—The mastic tree or shrub grows to the size of a small, scraggly crab tree, but is more bush-like. Much does it resemble the cratægus tree of America. Its bark and small limbs carry numerous ducts that are prone to part with their resinous secretion. This, as it exudes, is brilliant, colorless, water-white, about the consistence of glycerin or honey, exuding from abrasions, or even forcing itself through the natural bark, dripping therefrom in tears. I even observed limbs without any visible abrasions, yet glistening with tears. The slightest abrasion is followed by an abundant flow of gum.

METHOD OF COLLECTION.—About June the ground below the trees is cleaned of trash, and roughly prepared to catch the drip. The branches are then lav-

Digitized by Google

ishly scarified with superficial incisions. The resinous juice immediately begins to exude and drips to the earth, where it gradually hardens, in different qualities as concerns cleanliness. It thus becomes a conglomerate of isolated tears, agglutinated fragments, and masses of uneven consistence, the quality being inversely in accordance with the foreign matter present, such as fragments of bark, leaves, sand and dirt. Since a single large shrub is capable of producing ten to twelve pounds, and the resinous tears drop in profusion beneath the shrubs, the glitter of the crystal masses on the limbs, in the sunshine, is very pleasing.

When the fallen tears are dry, or hard enough to be handled, the mastic is picked up by means of tongs or pincers, put into baskets, and sold to local dealers. It is then called "kilista" (spelled for me by Mr. Agop Alpiar, of Smyrna). The merchant employs girls and women to separate the grades, of which the large, single, transparent tears are "first." This quality is largely used by the rich Turkish ladies, who chew it as a breath perfume. The irregular, semi-opaque masses constitute the second quality, whilst the mixture of small fragments, of all consistencies, makes a third, very low grade.

Opalescence or dullness of mastic globules or tears may be due to dust on the surface, to adhering impurities, or to scratched or abraded surfaces. In order to brighten the product, the hard, dry fragments are placed in tanks of cold water and hand-washed, sometimes with a preliminary scrubbing with soap-suds. The friction between the fragments removes the dust and brightens the surface to a glass-like transparency. The process is most successful in cool, dry weather,

Digitized by Google

October and the winter months being the season selected.

Steamers touching at Chio are boarded by men with baskets of peculiarly shaped little earthen vases filled with fine chewing mastic, which they sell for 2½ piastres each. These have been celebrated from time immemorial, and are today in form and size as they were in times gone by.

Mastic is gathered from June to September, the process being disturbed if there be excessive rains. No adulterations of the drug are consummated in Turkey, but since mastic is offered elsewhere cheaper than it is supplied in Smyrna, where the product of Chio naturally gravitates, we may infer that manipulative processes are elsewhere possible.

Commercial Features.—As before stated, mastic was once one of the important Oriental products, being prized from times gone by by the ladies in the rich Turkish harems as a breath perfumer, in which direction it is yet employed by the Turkish people. That this use is not illogical from a sanitary stand is shown from the fact that mastic carries a decided volatile aromatic that is powerfully antiseptic, which can not be said of all "chewing gums." Possibly the nearest American chewing gum that in this sense approaches mastic, is the natural spruce gum of the north, or the "sweet gum" of the middle west and the south, both of which carry breath-sweetening, antiseptic aromatics. Mastic is to be found in the Turkish bazaars generally, where it is displayed in the shops in separate piles, of different qualities. Choice tears are often sold in boxes holding about an ounce. The price was formerly as high as forty-five dollars per kilogram, but it is now about two

Digitized by Google

dollars, while the second and third qualities range from one dollar to a dollar and twenty cents per kilogram. About two hundred thousand kilograms are produced each year, of which 170,000 kilograms are exported. Owing to the abundance of less costly resins, its field as a varnish maker is much restricted, whilst its use as a constituent of pharmaceutical preparations, such as ointments, in which mastic was important during mediæval times, is now practically obsolete.

RAKI, RAKEE, OR "MASTIC."—This is a popular, mastic-flavored, alcoholic cordial liquor, much drunk by the non-Moslem populations of some parts of Turkey, but not by the Mohammedans, who so far as I could determine, use no alcoholics. It is made by distilling a mixture of mastic and anise with strong wine or alcohol, the following being the formula of Mr. Agop Alpiar:

Alcohol 35 per cent	1,000 Cc.
Aniseed oil	2.5 Gm.
Mastic	15 Gm.
Potassium carbonate	3 Gm.

Mix together and distill, slowly reserving the fractions, as follows:

No. 1	250 Cc.
No. 2	350 Cc.
No. 3	160 Cc.

To No. 2, (350 Cc.), add 10 Gm. powdered sugar. This is *raki*, or *rakee*, the drink being known also as *mastic*.

After this process, the drink is subsequently continuously made as follows:

Mix No. 1, (250 Cc.) with No. 3, (160 Cc.), and add water, 90 Cc.; alcohol (35%) 500 Cc.; aniseed oil 1.25 Gm.; gum mastic 7.5 Gm.; and potassium carbonate 3 Gm.

Digitized by Google

Distill as before, the second portion, (350 Cc.), constituting Raki. The process may be thus continued indefinitely, the second fraction of distillate being reserved for use.

The inferior grades of mastic are utilized in making this drink, of which 300,000 litres are estimated as the yearly output.

Raki, or "mastic," is a colorless, transparent liquid, of a pleasant, aromatic, anise-mastic flavor. The drinker does not take it clear, but adds to it about one-third its bulk of water, which by precipitation of the volatile oils, turns the mixture milky. This drink is used in moderation, owing to its strong alcoholic composition, but to Americans it does not appeal, reminding one rather of paregoric, than of a grateful cordial. This drink is probably of great antiquity, and known to the Greeks and Romans.

CONFECTION OF MASTIC.—A much prized confection of mastic is prepared by making a syrup of sugar, and when reduced by boiling to a very thick consistence, stirring into it a sufficient amount of powdered mastic to flavor it. This produces a stiff confection of a pearly white color that I was informed is especially a favorite with the Greeks. It is served as a course by itself, with a cool drink, or as a separate course of sweet after a meal. The following formula was given me by Mr. Lymberis, of Smyrna:

Confection of Mastic

Sugar	3 lbs.
Water	2 pts.
Citric acid	1 dram.
White of one egg	
Mastic, powdered[1]	¾ oz.

[1] Mastic, like camphor, (to which a few drops of alcohol needs be added), can not be powdered alone. The powdering is accomplished by mixing with the hard, small tear mastic, enough sugar to prevent its agglutination when rubbed in a mortar.

Digitized by Google

Dissolve the sugar and acid in the water, and stir in the white of egg. Boil, skimming occasionally, until the thick syrup will retain its form when dropped on a piece of cold marble, or when a small amount is poured into cold water. Remove from the fire, cool in a capacious vessel, and then stir in the powdered mastic. In this connection, it may be stated that an item of great interest to me was the numberless forms of sweets and cakes consumed by Oriental people.

The use of mastic in medicine followed its empirical employment as a breath sweetener, (for which purpose it is sold in all Oriental bazaars), and as a flavor for cordials and other drinks. Perhaps the first record of its authoritative employment in medicine is about the 13th century, by the Welsh "*Meddygon Myddfai*," (507), as an ingredient of ointments.

MATICO (Matico)

Official from 1860 to 1900. Dropped in 1910.

Matico, *Piper angustifolium*, is a shrub native to Bolivia, Peru, Brazil, Venezuela, and other South American countries. Its qualities are said to have been discovered by a Spanish soldier named Matico, the legend being that he applied some of the leaves to a wound, and observed that the bleeding was thereby stopped. This legend, current in South America, gave to the shrub the name *soldier's herb*, or tree. (See *Hyoscyamus*). It is probable, however, that its native use was learned from the Indians. In the beginning of the 19th century matico came to the profession of medicine in North America and in Europe, being conspicuously introduced by Jeffreys (340), a physician of Liverpool, who commended it, 1839, as a styptic and astringent.

Digitized by Google

The introduction of matico must, however, be considered as empirical, through the infusion of the leaves used by the aforenamed soldier.

MATRICARIA (German Chamomile)

Introduced in 1840, but in this and the following edition it occupied a place in the Secondary List. It was promoted to the Primary List in 1860, and is official through 1910.

Matricaria Chamomilla, German chamomile, is the cultivated form of *Chrysanthemum Parthenium*, cultivated for domestic use, in which it is distinguished from the *Anthemis nobilis*, or Roman chamomile. It has been so long in domestic use as to have made it familiar to all German housewives, and considerable demand has been created for it in sections of America where Germans have settled. It is a home remedy of antiquity. Flückiger and Hanbury, (240), give careful studies of chamomile and its botanical equivalents, which need not be reproduced.[1] Recently, (1917), the flowers of the common "dog fennel" have appeared under the name *"German Chamomile."*

MEL (Honey)

Official in each edition of the *Pharmacopeia*, from 1820 to 1910.

Honey is a saccharine substance collected chiefly by the honey bee, *Apis mellifera*, from the nectariferous glands of flowers and deposited in the comb by the insect when it reaches its hive. It is familiar to all civilized peoples, as well as to the natives of many sections of the world. In some parts of the tropics wild honey is an article of importance. Crude honey-comb was observed by us as one of the articles of export from

[1] A study of botanical equivalents of all plants yielding pharmacopeial drugs, by such an authority as Professor Henry W. Rusby, is of exceeding importance. A study of *drugs* needs this more than I can say.—*J. U. L.*

Digitized by Google

Aden, Arabia, coming thereto by caravan from the interior of Arabia, as well as across the Red Sea from Somali Land, Africa. The surprisingly large amounts of *bees' wax* entering Aden (1906) testified to the luxuriance of the flora of Somali Land, and perhaps to the fertility of the unexplored valleys of Arabia as well. The delicious flavor of the honey of Greece, collected in the mountains, has never been paralleled in our experience. The domestic record of honey is lost in antiquity, it being mentioned in many early works, including both the New and the Old Testaments, and in such Oriental works as the *Arabian Nights*. (88). In the making of confectionery and in domestic empirical medicine, honey has of course been a constant and a natural sweetener. Certain kinds of honey, such as that made from the opium poppy, ("mad honey"), or from the flowers of the wild jasmine, possess more or less narcotic action, which quality has never yet been intentionally utilized in medicine. To a Drug Treatise, *Opium and Its Compounds*, (388c), 1908, the writer contributed as follows:

"MAD HONEY."—In the flowering season of the opium poppy, bees make a honey possessed of narcotic qualities, known as "Mad Honey." Partakers of it wander aimlessly about, talk incoherently, and appear crazy. It is not a soporific, seemingly having quite different qualities from morphine. That the affection is not serious, however, is evidenced by the fact that in Harput, Turkey, Mrs. Thomas H. Norton, wife of the American consul, informed me that when she inquired what possessed a man she observed under its influence, the reply was that he was "Honey Mad."

Such compounds as honey of rose, honey of borax

Digitized by Google

and the like, came from the domestic use of honey. These confections long preceded the use of honey by licensed physicians. Burton, in his edition of the *Arabian Nights*, says:

"*Zardah* (*yellow rice*) is a word still used in Turkey, and refers to a dish of rice dressed in honey and saffron."

— MENTHA PIPERITA (Peppermint)

Official in each edition of *U. S. P.*, from 1820 to 1910.

Peppermint (*Mentha piperita*) is found throughout North America as well as in England and the Continent. As described by Ray, (536), the clergyman botanist, in his *Historia Plantarum*, 1704, under the title "*Mentha palustris—Peper-Mint*," it is recommended as a remedy for weakness of the stomach and for diarrhea. It was extensively cultivated in some parts of England as early as 1750, the herb being carried to London for distillation and the making of the oil. Peppermint is a favorite domestic herb used in decoction as a stimulant and also as a flavor. Fresh mint is employed to flavor a popular Kentucky alcoholic beverage made of whiskey, known as mint julep. This should be made by *inverting* (*tops down*), in the sweetened, diluted whiskey, a small bunch of young mint sprouts, thus imparting the delicate aroma of the leaves, but not the bitterness of the broken stems.

— MENTHA VIRIDIS (Spearmint)

Official in all editions of *U. S. P.*, from 1820 to 1910.

Spearmint, *Mentha spicata*, (formerly official under the botanical name of *Mentha viridis*) is common throughout Europe, Asia and North America, and, es-

Digitized by Google

caping from cultivation, it is found wild throughout most of the temperate regions of the world. Parkinson, 1640, speaks of it as a garden plant only, (492), and its mention in early medieval lists of plants demonstrates that it was cultivated in the convent gardens of the 9th century. Turner's *Herball*, (656), 1568, calls it *Spere Mynte*. Its use is largely that of a domestic and popular flavor in confectionery and as a perfume. In the form of an aromatic tea it has been a great favorite in domestic medicine, as is true also of its harsher relative, peppermint, the name "peppermint" applying commonly to spearmint. Like its relative, spearmint frequents moist and (preferably) shady bog lands, growing abundantly wild along streams in woodland pastures and meadows in Kentucky during the boyhood of the writer.

MEZEREUM (Mezereum)

Official in all editions of *U. S. P.*, from 1820 to 1910. *U. S. P.*, 1910, directs the bark of *Daphne Mezereum*, *Daphne Gnidium* or of *Daphne Laureola*.

Daphne Mezereum is an acrid shrub familiar to persons conversant with domestic medicine in medieval English times, it being employed by the herbalists and also, somewhat, by the medical profession of that day. It was recognized in Culpeper (175) as an acrid substance, generally applied externally, although it was given internally in dropsy and some other affections, about a dram of the dried bark of the tree being mixed with three parts of water, and taken internally. Hooper (325) in his *Medical Dictionary* states that a prevailing method of preparation was to macerate thin slices of the bark of the fresh root in vinegar and apply it externally. In Stephenson and Churchill's *Medical Bot-*

Digitized by Google

any (614a) a Mr. Pierson serves as authority for a Dr. Russel, who, as did Mr. Pierson, reviewed the asserted uses of the drug as a substitute for mercury and as an application in scrofulous and cutaneous affections, but decided in opposition to its use, on account of its exceeding acridity. A refreshing innovation upon former primitive processes of medication was this thought for the comfort and welfare of the patient. This imported, disagreeable drug crept into the *United States Pharmacopeia* and American practice through traditional European authority, and by reason of the fact that it was a constituent of the once popular "Compound Syrup of Sarsaparilla," maintained its position in medical literature.

— MOSCHUS (Musk)

Official in all editions, from 1820 to 1910.

Musk, *Moschus moschiferus*, was described by Aëtius (6), who lived about the middle of the 6th century A. D. Benjamin de Tudela (55a), who traveled through the East about 1160-1173 A. D., also mentions musk, stating that its native home is in Thibet. Its sale in Egypt is mentioned by Leo Africanus (378b), in 1526. The introduction of musk to medicine, however, came at a much earlier period, its employment in that direction following the commendation of Aëtius. Its therapeutic use was due to its introduction from the Arabians. Tavernier (627), 1676, asserted by Eugene Rimmel (552) to be the first European traveler to mention this drug, reports that he bought 7,673 pods of the musk-deer, indicating its abundance at that date. The use of musk as a perfume antedates European record, whilst there is no data concerning its intro-

Digitized by Google

duction as a stimulant. This writer learned early, during his services in prescription pharmacies, that when tincture of musk was prescribed, the patient was expected to die.

MYRISTICA (Nutmeg)

Official in each edition, from 1820 to 1910.

The tree yielding nutmeg, *Myristica fragrans*, is native to New Guinea and islands of the Malay Archipelago, from whence it has been introduced to Sumatra, Brazil, the West Indies, and other countries favorable to its cultivation. It has been asserted that the nutmeg was not known to the ancients, but von Martius (409), *Flora Brasiliensis*, 1860, contends that it was mentioned in the "*Comedies*" of Plautus, about two centuries B. C. The nutmeg has been an article of import and export from Aden, Arabia, since the middle of the 12th century, and by the end of that century both nutmeg and mace had reached Northern Europe. Nutmeg came naturally into domestic culinary use, being classed with mace, cloves, calamus, etc. It naturally appealed as an aromatic in cordials, elixirs and syrups of early European pharmacy, and is yet a useful and pleasant constituent of many domestic compounds. Its use in legalized medicine, also, has been chiefly in the direction of a flavor to other substances, and followed in its application similar empirical preparations.

MACE.—In connection with nutmeg, attention may be properly drawn to mace. The quaint description found in Motherby's (451b) *Medical Dictionary*, 1775, answers our purpose as well as would a more modern article. It is as follows:

"*Macis.* (Mace.) It is the middle bark of nutmegs.

Digitized by Google

It is of a lively red colour when fresh, but grows paler with age. It envelops the shell which contains the nutmeg. It is dried in the sun upon hurdles, which are fixed one over another, and then it is sprinkled with seawater to prevent its crumbling in carriage. It hath a pleasant aromatic smell, and a warm, pungent, bitterish taste. Its qualities are similar to that of nutmeg, both as the subject of medicine and of pharmacy. The principal difference is, that mace is warmer, more bitter, less unctuous, and sits easier on weak stomachs; in its yielding, by expression, a more fluid oil; and, in distillation with water, a more subtile volatile one."

What is called in the shops expressed oil of mace, is pressed from nutmegs. See *Nutmegs*.

MYRRHA (Myrrh)

Official in each edition of *U. S. P.*, from 1820 to (including) 1910. The *U. S. P.*, 1910, directs the gum-resin of one or more species of *Commiphora*.

Myrrh, a gum-resin from *Commiphora Myrrha*, has been a constituent of incense, perfume, and such, in ceremonial religious life, as well as an article employed by the common people from the days of the most remote antiquity. It was one of the rare and precious gum-resins in the days of the Bible, being mentioned in connection with such substances as frankincense and olibanum. That it was highly valued in the days of Solomon is evident from the fact that it is mentioned conspicuously in connection with the gifts brought by the Queen of Sheba to that monarch. It is yet obtained from Arabia, the present writer finding it in the bazaars of old Aden and bazaars in adjacent Oasis villages. In this connection it may be stated that the term "old Aden," a city that had an existence as a port of export

Digitized by Google

for Oriental products in very early days, refers to the Arabian town, situated in the bowl of a volcano. It is distant several miles from "*new* Aden," (Adenport), the village seen from steamers. Theophrastus (633), Pliny (514), and other early writers mention myrrh, which from all times has been valued in domestic medicine for its aromatic qualities. It is also a constituent of incense. In *Herodotus* (314a), (Macaulay, Book II, p. 153), it is named as one of the substances used by the Egyptians in embalming the dead. Let us quote:

"First with a crooked iron they draw out the brains through the nostrils, extracting it partly thus and partly by pouring in drugs; and after this with a sharp stone of Ethiopia they make a cut along the side and take out the whole contents of the belly, and when they have cleared out the cavity and cleansed it with palm-wine they cleanse it again with spices pounded up; then they fill the belly with pure myrrh pounded up and with cassia and other spices *except frankincense*, and sew it together again."

In order to give the standing of myrrh in early European medicine, as well as to illustrate the fact that *adulteration* is not a modern innovation, we quote from Motherby's *Medical Dictionary* (451b), 1775:

"*Myrrha.* (Myrrh.) It is also called stacte. It is a gummy resinous concrete. It is brought immediately from Alexandria, Smyrna, and Aleppo; but from what plant it is obtained is uncertain. It is brought to us in globes or drops of various colours and sizes. Chuse such as is of a reddish brown colour, not verging too much to yellowish or blackish; such as is uniform on the outside, internally speckled or streaked with white,

Digitized by Google

clear and bright, somewhat unctuous to the touch, but not tenacious so as to stick to the fingers.

"This drug is subject to a variety of frauds; it is mixed with hard shining yellow pieces of a gum which resembles gum arabic, and is void of smell or taste. Pieces of bdellium are mixed with it, and are known by their darker colour, and their being soft within, which myrrh never is, also by their different smell and taste. Sometimes an unctuous gummy resin, of a moderately strong, somewhat ungrateful smell, and a bitterish, very durable taste, obviously different both from those of bdellium and myrrh. Also pieces of a hard, compact, dark colored kind of tears, less unctuous than myrrh, of an offensive smell, a most ungrateful bitterness, and of a very resinous nature."

NUX VOMICA

Official in each edition of *U. S. P.*, from 1820, following.

This drug is the fruit of a tree, *Strychnos Nux-vomica*, indigenous to most parts of India, especially the coast districts, and is thought to have been introduced into medicine by the Arabians. The natives of India did not, however, value it, probably because of its exceedingly energetic nature. Although the Hindoos of the present time employ it extensively, it is probable that they were not acquainted with it before its introduction into Germany, in the 16th century. Its European employment was originally as a drug-shop poison, for the purpose of killing animals and destructive birds, such as crows; it was not until after the days of Parkinson (492), 1640, that its employment in medicine began. As usual in those days, enormous

Digitized by Google

doses of drugs were administered, and the fatal effects of nux vomica were soon recorded. Lewis' *Materia Medica*, 1761, (382), discourses as follows:

Nux Vomica.—*Pharm. Paris. Nux Metella. Vomic Nut.*: a flat roundish seed or kernel, about an inch broad and near a quarter of an inch thick, of a grey colour, covered with a kind of wooly matter, internally hard and tough like horn. It is the product of a large tree growing in the East Indies, called by Plukenet *cucurbitifera malabariensis, œnopliæ foliis rotundis, fructu orbiculari rubro cujus grana sunt nuces vomicæ officinarum.*

This seed discovers to the taste a considerable bitterness, but makes little or no impression on the organs of smell. It has been recommended in tertian and quartan fevers, in virulent gonorrhœas, and as an alexipharmac: Fallopius relates, that "it was given with success in the plague; that in doses of from a scruple to half a dram, it procured a plentiful sweat; and that where this evacuation happened, the patient recovered. At present it is looked upon, and not without good foundation, as a deleterious drug; which, though like many other deleterious substances, capable, in certain doses and in certain circumstances, of producing happy effects, has its salutary and pernicious operations so nearly and so indeterminably allied, that common prudence forbids its being ventured upon. Hoffman tells us of a girl of ten years of age, to whom fifteen grains, given in two doses, for the cure of an obstinate quartan, proved mortal."

As an exceptional authority concerning the neglect of nux vomica by early Indian observers, let us quote from Dymock:

Digitized by Google

No mention of nux vomica can be found in the older Sanskrit medical works. A drug called Vishamushti, mentioned by Sarangadhara, has by some been supposed to be nux vomica, but according to the Bhavaprakasha, Vishamushti has an edible fruit, and is called Karerna in Hindi. The latter work gives Kupilu and Kulaka as Sanskrit names for Kuchila, but these names are generally referred to a kind of ebony. Another Sanskrit name given to the drug in recently compiled works is Kurachilla, an incorrect form of Kuruchilla, "a crab," to which animal the seeds bear some resemblance in shape. We think there can be little doubt that nux vomica was not used medicinally by the ancient Hindus, but the Hindi name Kuchila or Kuchula occurs in ancient Persian, and appears to be derived from the Sanskrit kunch, to make crooked. We also find an unidentified plant called Kuchela, mentioned by Sanskrit writers, with the synonyms of Avi-karni and Viddha-parni; the name Kunchaphala is also met with, but it may possibly be only an incorrect rendering of Kucha-phala, a term for the pomegranate. We can hardly suppose that a plant having such marked poisonous properties can have escaped the notice of the earliest settlers in India, and there can be no doubt that the wood has been in use from a very early date as one of the kinds of Mushadi in Southern and Western India. We also find that in the Indian Archipelago, which was colonized at a very early date by the Hindus, the wood is used as a popular remedy for dysentery, fevers and dyspepsia, under the name of Bidara-laut by the Malays. This name appears to be of Sanskrit origin and to be derived from Vidara, "splitting or rending," and lata, "a tree or shrub," in allusion

Digitized by Google

to the tetanic spasms produced by over-doses of the drug.—Dymock, *Pharmacographia Indica*, v. 2, p. 459.

OPIUM

Official in all editions, from 1820 to 1910. The *U. S. P.*, 1910, makes official the product of *Papaver somniferum* and its variety *album*.

The discovery of the medical qualities of opium is lost in times gone by. Theophrastus (633), 3rd century B. C., mentions it. The poppy producing opium is from prehistoric times, native to Asia Minor and Central Asia. The early use of the decoction of the poppy head, as well as the early use of opium, the product of the poppy, *Papaver somniferum*, antedates professional medication, creeping into home use as well as professional use at a very early period. The Welsh physicians of the 17th century used a wine of poppy heads to produce sleep, and prepared pills from the juice of the poppy. Syrup of poppy was given a position in the first Pharmacopeia of the London College, 1618. Dioscorides (194) distinguishes between the juice of the poppy capsule and an extract from the entire plant. Inasmuch as he describes how the capsule should be incised and the juice collected, it is evident that he plainly refers to opium. Pliny (514) also devotes considerable space to this drug. Celsus (136) in the 1st century mentions it, and during the period of the Roman Empire it was known as a product of Asia Minor. It is supposed that the prohibition of wine by Mohammed led to the spreading of the use of opium in some parts of Asia, the drug being then an import from Aden or Cambay. The Mohammedans introduced opium into India, it being first mentioned as a product of that country by Barbosa (39), who visited

Digitized by Google

Calicut in 1511, its port of export being then Aden or Cambay. The German traveler Kämpfer (349), who visited Persia in 1685, described the various kinds of opium then produced, stating that it was customary to mix the drug with various aromatics, such as nutmeg, cardamon, cinnamon, mace, and even with ambergris. It was also sometimes colored red with cannabis indica, and was sometimes mixed with the strongly narcotic seeds of stramonium. One of the studies made in the Orient by the writer, (1906), was of opium. A brief résumé is as follows:

ORIGIN.—Wherever the opium poppy grows, opium of some degree of value is possible. But climate, soil, value of land and price of labor, limit its area and control its profitable production by the tedious methods now employed. Opium has been an important crop in Asia Minor, Persia, India, China, and triflingly so in Egypt. In Europe and North America attempts to produce it failed, partly because of climatic conditions, but mainly by reason of labor expense. Now as in the past, its home is in the land known as Asia Minor, the principal port of export being Smyrna. Hence, in making our study of the drug, we sought this city, and in its vicinity made our research.

THE OPIUM POPPY.—Everywhere about Smyrna, in the months of April and May, a beautiful, scarlet, single poppy prevails as a weed. It accompanies all crops, blooms along the roadside, and seeds itself year by year. This very conspicuous variety of poppy is also abundant throughout adjacent countries, being found in Greece, Italy, and the Mediterranean Islands generally. This, however, is *not* the opium poppy, although accepted as such by many travelers. No opium poppy

Digitized by Google

is found wild in these sections, nor is it cultivated in less than five hours by rail from Smyrna. No opium is produced in the immediate vicinity of Smyrna.

The opium poppy, *Papaver somniferum*, blooms in April and May. Its color varies from a light pink to a purplish pink. The specimen in full bloom photographed by me May 3, 1906, measured five inches in diameter, and was of a pronounced, narcotic odor. This is a typical poppy blossom, grown in its home land. The capsule, at this stage, is half an inch in diameter.

CULTIVATION.—The soil that profitably produces opium is a somewhat silicious clay. The preferable locations are rich, valley lands, plains not too wet, and the foot-slopes of the mountains. The plant thrives at various altitudes, even high mountain table-lands and mountain valleys proving admirably suited to its growth.

The soil is roughly ploughed in the early fall, and it is essential that it be abundantly enriched with barn-yard manure. In October, if it be possible at that time to get the ground in condition, the seed are sown broadcast over the well-smoothed field. Before sowing, the seed are mixed with sand, as is the method with grass and other small seed. About thirteen ounces of seed are allowed to the acre. The seeds are taken from the poppy capsules of the previous year, and range in color from bluish to yellow and white, the bluish color being preferred.

Germination results in accordance with the altitude and the moisture of the season. In about thirty days the plants are an inch high. November to December, snow falls in the opium section, covering the plants.

Digitized by Google

Upper. PLOW BOY IN OPIUM FIELD, TURKEY (Page 224)

Lower. TURKS INSPECTING OPIUM (Page 224)
Warehouse of A. Keun & Co., Smyrna, Turkey.

Photographed by John Uri Lloyd.

Digitized by Google

Digitized by Google

Should the snow now melt and a freeze succeed, the crop is ruined. Early frosts, preceding snow, are also very injurious, because the poppy plant, when young, is very delicate. If the snow falls early and remains all winter, the plants reach perfection. Thus an ideal opium climate is such as best fits the wheat crops.

In the spring, after the snow melts and the plants have attained a growth of about six inches in height, the fields are thoroughly weeded, the poppy plants being thinned until they stand about two feet apart. When they are evenly distributed over the field in such condition, the crop is most promising. However, should the winter frosts have "winter killed" the crop in patches, the thin parts are replowed, and spring-sown. If the crop be injured as a whole, the entire field is replowed and spring-planted, or a new location for the crop is selected. This replanting takes place from January to March, according to locality. Spring sowing is deprecated, both by reason of the extra labor, and because the resultant opium is of inferior quality, and the yield less in amount. Opium culture demands that ground which has produced an opium crop for four or five successive years be given a rest of at least one year.

The Crop.—The poppy blossoms in April and May. The capsule matures from June to July, in accordance with locality and season. The elevated, interior districts are latest in maturing, but they yield the best opium, that from the damp or wet lowlands being the poorest. When the plant attains a height of four to five feet and the capsules begin to turn successively from bluish-green to yellowish or slightly golden, they soften to the touch. This is the critical period in the life of this exacting crop, for at this time neglect, of

Digitized by Google

even four hours, is sufficient materially to decrease the returns. Now the patience of the Turks, most patient of all people, is taxed to the utmost. The entire population, men, women, boys and girls, turn to the harvest.

Carefully the workers pass through the fields, and with a knife that bears a fine saw-edge they artfully incise the ripening heads, making their incision around the circumference of the capsule, encircling it to within half an inch of the starting point. About Harput, and perhaps in other districts, the natives employ a knife having three parallel blades, with which they cut several short, diagonal gashes, just above the belly of the capsule. The incising is a very delicate operation, requiring both care and expertness, for should the knife pierce into the interior of the poppy capsule, the exuding juice seeps inward, and is lost. The aim is to pierce only the pericarp, that carries the lactiferous cells.

When the climate is fair, the location elevated, the wind from the north and cool, and the soil dry, the incisions are made after sunset, the exuding juice being gathered early the next morning. But should there be either dew or rain, there is no yield whatever.

On low ground where dew prevails, the incisions are made early in the morning, the "tears" of opium gum being scraped from the capsule that day, from eleven o'clock to sunset.

Implements.—The blade of the incising knife is about two inches long, one edge being straight, with small, saw-teeth, the other being egg-shaped, sharp and pointed. This knife is called *Dgeezguee* (pronounced *geez-gee*). The saw-edge of the knife is used to incise the capsule, the opposite edge to scrape from the capsule the exuded gum. As this accumulates, the natives

Digitized by Google

from time to time transfer it to a wooden tray about six inches long and one inch deep, the transfer being assisted by means of a small steel blade inserted for the scraping purpose into the part of the tray nearest the handle. This tray is called an *Alguee*.

THE GUM.—The freshly-scraped gummy exudate (opium "tears"), is of a soft, pillular consistence, averaging from forty to forty-five per cent moisture. The crop of "tears," as it accumulates, is transferred from the Alguee to an earthen vessel or tray, but is sometimes dumped on the sand or earth, where it is kneaded by the hands to a uniform consistence, after which it is made into balls of various sizes. These balls are enclosed in a dress of poppy leaves, placed on trays, and slowly cured in the shade, in a cool location. When they have reached the proper consistence the balls, familiar as the opium of commerce, are packed in baskets, an abundance of mixed dried seeds and leaves of wild rumex being used to keep them apart, and to absorb moisture. The opium in these baskets averages from one hundred and sixty to one hundred and eighty pounds. The baskets are of wicker, of uniform size and shape, about three feet deep and one and one-half feet in diameter. They are nearly cylindrical and are lined with linen.

To make the opium crop even a possible success, the very richest land is necessary, and it must be enriched by constant manuring. The climate must be nearly rainless in the summer, and yet, throughout a necessarily mild winter, snow must continually blanket the earth. The agriculturist must be ever watchful, ever patient, and must expect disappointments, even total loss at the last moment. Unfavorable drouths in the

Digitized by Google

spring, destructive insects, winter freezes or harmful rain during the collecting season, may result in great loss or total failure. There must be an abundance of labor procurable at the critical period, at from thirty to fifty cents per day of fourteen hours. All these conditions favor the Turkish opium section. No other people can be more frugal, more patient, more resigned to adversity, or more ready, when failure comes, to begin over again than are the Turks. (This passage was written in 1908, long before the outbreak of the world's war. But the same national characteristics are no doubt theirs, now as then.)

Under favorable conditions as concerns climate and care, an acre of good soil will yield from twenty-five to forty-five pounds of opium. It is calculated that to produce this requires 21,000 poppy plants, averaging six capsules each. (This data is from the book of Mr. Agop Alpiar, Chemist of A. Keun and Co., Smyrna, who made the calculation in the field.) In addition to the opium, about 1,000 pounds of poppy seeds are obtained, capable of producing 400 pounds of oil, valued at five to eleven cents per pound. This oil is an important article of food with the frugal agricultural classes of the interior, beyond the zone that produces the olive tree, which does not thrive farther than fifty miles from the sea. The time of collection lasts, in Turkey in Asia, for two and one-half months, although but a few days for harvesting are possible in any one location. The industrious peasant, in the harvest period, working from daylight to dark, earns from fifteen to forty-five cents daily. If the crop be a success, the land-owner reaps a moderate return for a whole year's care and labor devoted to the most exacting of all crops, not excepting

Digitized by Google

tobacco. If the crop be a failure, and it may at the last moment become nearly a total loss by rain, or by frost in the fall or spring, the patient Turk says, "Inshâllah Kissmet yarren guëlir"—"With the will of God, good luck may come tomorrow."

CHARACTERISTICS.—Fresh, prime Smyrna opium has a soft consistence, and in color is dark yellowish, or brown. It breaks with a tough pull and an uneven fracture. The crust is much darker than the central part, and much drier. The structure of the ordinary quality is not smooth, owing to the presence of foreign substances, such as the scrapings of the capsule and gum of unequal consistence. The odor of prime opium is strongly and (to me) pleasantly narcotic, unmarked by any fruity flavor. The taste is bitter and peculiar. The morphine value of prime selected Smyrna opium averages (*Alpiar*) from ten per cent to thirteen and one-half per cent.

ADULTERATIONS.—In former years, before opium was valued by morphine percentage, some of the natives or dealers were given to profitable sophistication by the use of extraneous substances that increased the weight of the product, without disturbing the odor, the color or consistence. This habit lingers somewhat yet, although the growers and manipulators are fast learning that sophistication processes involve them in financial loss. About ten per cent of the opium that enters Smyrna was, in 1906, more or less adulterated, the *low* grades running from three per cent to six per cent morphine. Among the sophisticants may be named salep, sand, crushed raisins, apricot pulp, prunes, yolk of egg, excessive scrapings from the poppy capsules, shot or lead, iron, flour, extract of poppy heads, gum arabic, yellow

Digitized by Google

beeswax and powdered cumin seed. This last is very likely to deceive, by its color. The sand may naturally contaminate the gum, if the opium be spread on the ground during its collection. Nor is the presence of sand a sure indication of inferiority. The sand in our museum specimen, weighing ten ounces, came from only twenty-three pounds of choice, high-grade opium, assayed by Mr. Alpiar.

Formerly opium came from the interior of Turkey by camel caravan, but some years ago a railway was built that extends into the poppy region. The producer sells the crude opium, when cured, to commission merchants, who in turn supply the exporter as fast as a sufficient amount is accumulated.

Inspecting.—The inspector must be a man of experience, and may be one of a line of family experts. For example, Mr. Jacob Gabbai, who for thirty-six years (1906) had filled the place of inspector, with an average of 3,500 baskets yearly, was the grandson of a professional inspector, and was assisted by his brother and his son. The broken opium knife in our museum was his grandfather's, and had been used in opium testing for more than thirty years. The inspector sits cross-legged on a mat on the floor. The purchaser and the seller having agreed to abide by his decision, the opium baskets are successively dumped before him. Rapidly he cuts a deep circular cone from each ball, inspecting the interior by both sight and smell, rejecting those he considers inferior or adulterated. From some baskets most of the opium is condemned; from others, a few balls only are rejected. During the time I witnessed one of the inspections, the seller protested but once against

Digitized by Google

the decision. But the inspector refused to reconsider, stating that the ball was adulterated with prunes.

In some cases, when opium comes rapidly to market, several inspectors work simultaneously. It is remarkable how quickly and expertly they handle a basket of 180 pounds; how, with a single gash, these men, through the senses of sight and smell alone, prejudge a ball that, to an inexperienced person, presents no fault. The inspector is paid one-half of one per cent the value of the opium he handles.

Mr. Alpiar states that invariably the rejected opium runs down to six or even four per cent morphine. This, considering the remarkable rapidity of the inspector's work, and the fact that it is the expertness of empirical experience only, was to me inexplicable. In no other direction have I been confronted with the scientific result that comes by the empirical perfection of experience and the education of the senses.

ASSAYING.[1]—The accepted balls pass immediately into the hands of the purchaser, who now cuts each lump into halves, and from the *interior*[2] of each takes a piece about the size of an English walnut. One hundred baskets furnish about one hundred pounds of these samples, which are at once weighed and thoroughly incorporated into a uniform mass, in a tightly closed kneading machine, which prevents any evaporation of moisture. One hundred grammes are then *immediately*

[1] Dr. A. R. L. Dohme, *Proc. Amer. Pharm. Ass'n.*, 1893, pp. 169-177, contributes a paper on "Commercial Varieties of Opium," historical, descriptive and analytical. The assay results and process (pp. 175-177) are given in detail, the morphine content of seven natural named gums ranging from 10.53 per cent to 15.13 per cent. Our province being that of crude drug history, the reader can only be referred to the interesting chemical details and assay results.

[2] Dr. Squibb took his samples from the crust *inward*, sampling every fifth ball, if large; every tenth ball, if small. In Smyrna, *every* ball is inspected.

Digitized by Google

assayed to crystalline *white morphine*. For this purpose, the firm of Alfred A. Keun & Co., (1906), have a complete laboratory, well equipped with the most modern apparatus, including stills, vacuum apparatus, machinery and delicate glassware and reagents. Their chemist, Mr. Agop Alpiar, had at that time been engaged in this special work for fifteen years, and aside from his great personal experience his aim has been to keep abreast of the world's literature on opium and alkaloidal assay methods, by means of a voluminous special library. In this connection it may be of interest to state that he obtains 1.80 per cent more of white, crystalline morphine, than the assay process indicated by the *U. S. Pharmacopeia*. This, Mr. Alpiar considers, is due mostly to loss in the mother-liquors, where such small amounts as the *U. S. P.* directs, are employed. Such variations in assay by means of quantity influence is not exceptional, when assay processes employing minute portions are contrasted with successively connected batches on a manufacturing scale. It thus becomes possible to utilize, profitably, mother-liquors that, on a small scale, are necessarily thrown away.

Packing the Opium for Export.—In order to prevent mould, fermentation and subsequent structural changes that are liable to occur in the moist drug on protracted sea voyages and in storage for morphine makers, the drug is allowed to lose its excess of moisture before being packed in tin-lined cases, each holding from 130 to 170 pounds. This does not apply to commercial opium for general use (written in 1908), although it is likely that the crude drug will soon pass from pharmacy.

Digitized by Google

PAREIRA (Pareira)

Introduced into *U. S. P.* in 1840, in Secondary List. It held this place in 1850, and then became official until it was dropped, in 1910.

Pareira brava, *Chondrodendron tomentosum*, is a climbing shrub, native to Peru and Brazil and adjacent sections of South America. The Portuguese missionaries of the 17th century who visited Brazil learned of its reputed qualities from the natives, who under the name *abutua* or *butua* valued it highly for its therapeutic virtues. The Portuguese gave it the name *Pareira brava*, or *Wild Vine*, with reference to its mode of growth. Its reputed medical qualities, learned from the natives, were made conspicuous by Michel Amélot, ambassador of Louis XIV to Lisbon, who found it in that city and carried it with him to Paris. The botanist Pomet (519), 1694, described the plant in his *History of Drugs*, Paris. Lewis (382) in his *Materia Medica*, 1761, gives to pareira considerable space, citing its qualities and history as follows:

"This root is extolled by the Brasilians and Portuguese in a variety of diseases, particularly in suppressions of urine and in nephritic and calculous complaints. Geoffroy is of opinion, that its virtue consists in dissolving and attenuating tenacious juices; and reports, that in sundry disorders arising from their viscidity, it was found remarkably beneficial; that in nephritic pains and suppressions of urine, he has often given it with happy succes : that he has sometimes seen the patient freed from pain almost in an instant, and a plentiful discharge of urine brought on that in ulcers of the kidneys and bladder, where the urine was mucous and purulent and could scarcely be voided or not with-

Digitized by Google

out great uneasiness, the symptoms were soon relieved by pareira, and the ulcer at length healed by joining to it balsam of copaiba."

After an eventful botanical record embracing considerable discussion as well as confusion with some other drugs, during which pareira brava enjoyed professional conspicuity in Europe, it dropped from general use, the extravagant pretensions long made for it being now practically forgotten.

PEPO (Pumpkin Seed)

Introduced in 1860. Official in all later editions, including that of 1910.

The seed of the pumpkin, *Cucurbita Pepo*, in the form of an infusion as well as in a pulpy mass, has been long a favorite home remedy for intestinal parasites, a use that introduced it to the medical profession. But although physicians have used pumpkin seed somewhat in this direction, they as a rule now prefer other remedial agents, santonin being employed for round worms, and pomegranate bark for tape worms. Many years ago this writer endeavored to identify the active principle of pumpkin seed, but met discouraging results. It was demonstrated that an infusion or decoction *devoid* of fat and fibers was inert. The action is seemingly either *mechanical*, (like that of powdered tin), or the processes he employed to discover a soluble agent were faulty.

PHYSOSTIGMA (Calabar Bean, Ordeal Bean)

First mentioned in *U. S. P.* in 1870. Official in all later editions, through 1910.

The plant that yields Calabar bean, *Physostigma venenosum*, is a woody African vine, described by Bal-

Digitized by Google

four in 1860. It belongs to the great natural order Leguminosæ, tribe Phaseoleæ. It is a curious fact that these poisonous seeds are so closely related, botanically, to the ordinary edible bean of our gardens, that the structural difference resides mainly in the stigma. The genus at present (1897) consists of three species, *Physostigma venenosum*, Balf; *Physostigma cylindrosperma*, Holmes, and a recently described species, *Physostigma mesoponticum*, Taubert, all from tropical Africa. *Physostigma venenosum* is one of the numerous woody climbers that inhabit the tropical forests of Africa, sometimes reaching the length of fifty feet, with a stem two inches in diameter. The leaves are pinnately trifoliate, and in size and shape very closely approximate the leaves of the common "Lima bean" of our gardens. The fruit is a thick brown pod, each containing two or three large seeds familiar to us as "Calabar beans."

History.—The Calabar or ordeal bean seems to be confined in its habitat to a limited area only, around the Gulf of Guinea, and particularly about the mouth of the old Calabar River, hence its common name. The first report we have from that region concerning the use of this seed as an ordeal poison is by Dr. W. F. Daniell, who in 1846 ("Natives of Old Calibar," *Edinb. New Philos. Journ.*, 1846, p. 316), states that among the natives, "persons suspected of a crime are forced to swallow a deadly poison made from the seeds of an aquatic leguminous plant which rapidly destroys life." The seed is called *esere* by the natives, which accounts for one of the alkaloids of this bean being named eserine. We are informed that the Calabar bean as an ordeal is administered in various quantities. Less than half a

Digitized by Google

bean is sufficient to destroy life if retained on the stomach, while, on the other hand, numbers of them may (exceptionally), be eaten without fatal effects, if they quickly produce vomiting and purging (*Pharm. Jour.*, 1864-5, p. 99). In the native ordeal test, if the culprit vomit the nut, he is pronounced innocent and liberated; if it has a purging effect without killing him, he is considered guilty and sold into slavery. If he dies, which as a rule occurs, this is taken as being in consequence of his guilt. On the authority of Rev. Mr. Waddell, a missionary at Old Calabar, Dr. Christison states that the general confidence of the African in the infallibility of the Calabar ordeal test is so great, that innocent persons accused of a crime often demand to be subjected to it, and thus pay the penalty of their blind superstition. (*Pharm. Journ.*, 1855, p. 470.) It is intimated (*Pharm. Journ.*, 1877, p. 641), that the officials charged with administering the poison know how to select the less potent seeds when they desire to show favoritism. It is also stated that the test is often resorted to as a means of gratifying private revenge, and its use, in the opinion of the African missionaries, is a great moral evil on that account alone.

Prior to 1860 attempts to classify the ordeal seed botanically had been of no avail, because it was almost impossible for any European to obtain possession of specimens. According to Mr. Waddell, the plant at that time was everywhere destroyed by order of the native king, who exercised a complete monopoly over the few that were preserved to conserve the demands of justice. (Hanbury, D, *Science Papers*, 1876, p. 312. See also *Amer. Journ. Pharm.*, 1863, p. 316).

However, in 1855, Mr. Waddell secured a few speci-

Digitized by Google

mens of the seed, which he sent to Dr. Christison, at whose suggestion they were planted in the Edinburgh Botanical Garden by Professor Balfour; but although they attained a vigorous growth, they failed to produce flowers, and thus it was impossible properly to classify the plant. It was not until 1859 that the Rev. W. C. Thomson, a good botanical observer of Old Calabar, finally secured flowering specimens of the plant, which were preserved in alcohol and sent to Professor Balfour for the purpose of identification. The first account of the plant under its proper name was then given by Balfour in the *Proceedings of the Royal Society of Edinburgh*, January, 1860.

The Calabar bean, however, is not the only native poison that had been used as an ordeal among the blacks in Africa. The custom of subjecting persons accused of witchcraft, murder or other crimes, to the ordeal of swallowing poisonous vegetable infusions has unquestionably prevailed among African tribes from the west to the east coast. In the eastern regions the *Cubera tanghin*, or tanghin poison-nut, of Madagascar, (*Tanghinin venenata*) has been employed, while on the western coast there has been in use, besides the Calabar bean, the bark of a certain tree which has been differently named by different observers. This bark has become conspicuous as the "redwater ordeal" in use by the negroes of Sierra Leone. The interesting account of the ordeal trial given by Dr. Winterbottom as early as 1803 was extensively quoted by Professor Wm. Proctor in the *American Journal of Pharmacy*, 1852, p. 195.

"Redwater Poison" was obtained from the bark of a leguminous tree, *Erythrophlæum guineense*, Don, which

Digitized by Google

is identical with *Fillæa suaveolens*, a tree occurring in Senegambia, and described and named by Guillemin and Perrotet (*Index Kewensis*, Vol. II, p. 897). Finally, the much discussed "sassy bark," used under the name of casca or casca bark, as an ordeal poison among the natives on the banks of the Congo River, has also been shown to be identical with *Erythrophlæum guineense*, Don, (*Amer. Journ. Pharm.*, 1857, p. 114). It will thus be seen that Physostigma is but one of several ordeal poisons.

PHYTOLACCA (Phytolacca, Poke Root)

Phytolacca *Root* is mentioned in the Primary List of the first edition of the *U. S. P.*, in 1820 (2d edition, 1828), Phytolacca *Berries* being relegated to the Secondary List. Both the root and the berries were official in the New York edition of 1830, but in the Philadelphia edition, 1830, both were demoted to the Secondary List, a position they occupied in all succeeding *Pharmacopeias* until 1880, when they were wholly official, so remaining until 1910, when both were dropped.

"Poke Root," *Phytolacca decandra*, is a handsome plant found throughout the temperate regions of North America east of the Mississippi River, thriving in rich bottom lands, fence corners and woody pastures. The American Indians used it, pounded to a pulp, as a poultice. The early American settlers applied it in like manner as a poultice to inflammatory conditions of the cow's udder, in the disease known as garget, a circumstance which has given to the plant one of its common names, *Garget Plant*. Phytolacca crept thence into more extensive use in domestic medicine, a tincture of the plant being next employed. Following this came its introduction into professional practice. In Eclecticism it has ever been a valued remedy. To cite American Materia Medica references to phytolacca

Digitized by Google

would be to name the publications of all the representative authors since the middle of the last century connected with American medicine. The first edition, 1852, of the *American Dispensatory* (356) is the best published authority for the use of phytolacca at that date. Let us quote from this:

"Properties and Uses.—Emetic, cathartic, alterative, antiherpetic, and somewhat narcotic. The leaves are somewhat purgative, and are used, in some parts of the country, as a dressing to ulcers. A strong decoction of the leaves is of much benefit in hemorrhoids; injected into the rectum two or three times a day, and a fomentation of the leaves applied to the part, it will almost always give relief, and eventually effect a cure. Three or four drachms of the decoction may also be taken internally. Should it produce any narcotic effects, omit its use for a day or two, and commence again with smaller doses. The root excites the whole glandular system, and has been highly extolled in syphilitic, scrofulous, rheumatic, and cutaneous diseases. The extract of the root is an excellent remedy for the removal of those severe pains attending mercurio-syphilitic affections, (osteocopus). Roasted in hot ashes until soft, and then mashed and applied as a poultice, the root is unrivalled in felons and tumors of various kinds. It discusses them rapidly, or, if too far advanced, hastens their suppuration. A saturated tincture of the berries has been successfully employed in chronic rheumatism. It is also recommended in the same diseases as the root. Dose of the powdered root, as an alterative, one to five grains; of the tincture, one drachm, three or four times a day; as an emetic, twenty to thirty grains of the powder."

Digitized by Google

Buchan's *Every Man His Own Doctor*, 1816, indicates that phytolacca was then in high repute as a domestic remedy. From this we extract as follows (110):

"The young stems of phytolacca, when boiled, are as good as asparagus, but when old they are to be used with caution, being a plant of great activity, operating both as an emetic and cathartic. A tincture of the ripe berries in brandy or wine, is a popular remedy for rheumatism and similar affections; and it may be given with safety and advantage in all cases where guaiacum is proper. The extract of the juice of the ripe berries has been employed in some cases of scrofula; and cancerous ulcers have been greatly benefited by its application. The juice of the leaves, however, is said to be more effectual."

The amount of potassium nitrate in phytolacca root is exceptionally great. This may crystallize from alchoholic tincture in quantities. Possibly this fact accounts for the superiority of fresh root preparations in which natural water-sap serves as a diluent. In this connection we might refer to the fact that the writer of this historical review of drugs does not confine his opinion of therapeutic values to laboratory products and educts that are of an exclusively "organic" origin. Just what form many of the so-called "inorganic" materials take in natural plant structures is a question. See the author's contributions to the *Eclectic Medical Journal*, Cincinnati, on various phases of "the inorganic side of organic life."

Digitized by Google

PILOCARPUS (Pilocarpus, Jaborandi)

Official from 1880 to 1910. Not mentioned in *U. S. P.* in editions earlier than 1880. The *U. S. P.*, 1910, makes official the leaves of *Pilocarpus Jaborandi*, (Pernambuco Jaborandi of commerce) or of *Pilocarpus microphyllus* (Maranham Jaborandi).

Pilocarpus Jaborandi is a shrub native to Eastern Brazil, where Piso (511) of Holland, 1643, first mentions its use as a modifier of the infusion of ipecac. Plumier, 1693, (515), also refers to the mixture, describing therein two varieties of jaborandi. About 1854, Lemaire described *Pilocarpus pennatifolius*, then of botanical interest only. Its conspicuous introduction to medicine occurred in 1874, when Dr. Coutinho (170), of Pernambuco, from observing its native uses, made its qualities as a sialagogue known to the medical world. The name jaborandi is given in South America to a number of shrubs belonging to the *Rutaceæ* and *Piperaceæ*, the leaves of many of which are exported under the common term, "Jaborandi." In our opinion, the name "Jaborandi" should be either abandoned in medicine, or confined exclusively to the dried leaflets of the official species, *Pilocarpus microphyllus*, Stapf, and *Pilocarpus Jaborandi*, Holmes, which alone are recognized in the *Pharmacopeias* of 1900 and 1910.

In commerce, many meaningless terms are affixed to the drug, such as Pernambuco jaborandi, Paraguay jaborandi, Maranham or Small jaborandi, Ceari jaborandi, Aracati jaborandi, Rio Janeiro jaborandi, all relating to either the country where the drug is grown, the part of South America from which it is exported, or the common name applied by the people. It may be confidently stated that unless one is versed in botany and pharmacology, and indeed is experienced in the special field of the drug known as "Jaborandi," he may

Digitized by Google

expect to meet with gross imposition if he ventures to purchase the crude drug under any of these titles, or by the common name, "Jaborandi." Nor is this necessarily due to intent of either importer or jobber, for in general each dealer in this foreign drug is helpless in the face of conditions that lie entirely beyond his control, such as collectors at a distance. In our opinion, the best American authority on "Jaborandi" problems from the botanical side, is Professor H. H. Rusby, M. D., of the Columbia University, New York. His paper on "The Pilocarpus Leaves of Commerce," presented to the American Pharmaceutical Association in 1903, and republished in the *Bulletin of Pharmacy*, October, 1903, is invaluable. We have consulted this freely in our study of pilocarpus. Mr. E. M. Holmes, the best European authority, (see also *Index Kewensis*), states[1] that the following species and varieties were known under the name of *Jaborandi* as early as 1895. Since that date, two other species have been added (*Rusby*).

Leaves Simple	Leaves Compound, Imparipinnate
Pilocarpus spicatus,	Pilocarpus goudutianus,
" subcoriaceus,	" heterophyllus,
" longiracemosus,	" trachylophus,
" pauciflorus,	" pennatifolius,
" latifolius,	" selloanus,
" guaianensis,	" Jaborandi,
" humboldtii,	" microphyllus,
" racemosus,	" grandiflorus,
" riedelianus,	" macrocarpus.
" giganteus.	

Numerous researches on the chemistry of this drug have been made. "The Alkaloidal Value of Jaborandi

[1] *British Pharm. Journ. and Trans.*, 1895.

Digitized by Google

Leaves" was the subject of a paper contributed by Dr. A. R. L. Dohme to the American Pharmaceutical Association, 1895. (*Proc. Amer. Pharm. Ass'n.*, 1895, pp. 266-268). His conclusions were to the effect that the alkaloidal deterioration of the leaves as contrasted with the drug in the past was due to poor quality and not to substitution. The paper must be studied as a whole for details. But we must not further encroach on the duties of Dr. Waldbott and Prof. Heyroth, in whose field rests the history and record of the pharmacopœial drug constituents.

PIMENTA (Pimenta, Allspice)

Official in all editions excepting New York, 1830 and 1910, in which the product is limited to the *oil*. In the early editions, 1820-1828, 1830, the *berries* are named. From 1840 to 1870, the "unripe fruit," while later editions give "the nearly ripe fruit," the part to be employed.

Allspice, *Pimenta officinalis*, is the berry of a tree native to Jamaica and other West India islands, where it was found in use as a spice by the explorers in the days of the enthusiasm of the new world's discovery. It was probably this substance that Garret, a druggist of London, 1601, gave to Clusius (153), who described it in his *Liber Exoticorum*. According to Parkinson's (492) *Theatrum Botanicum*, 1567, it was imported into England soon after the beginning of that century, under the name *Round Cardamon*. It has received many different names in its passage through various countries, Lewis' *Materia Medica*, 1761, defining it as follows (382):

"*Piper Jamaicense, Pharm. Lond.* Piper jamaicense sive pimenta, *Pharm. Edinb. Amomum, Pharm Wirtenberg.* JAMAICA PEPPER, PIMENTO, ALL-SPICE: the dried aromatic berry of a large tree growing in the moun-

Digitized by Google

tainous parts of Jamaica, reckoned a species of myrtle, and called by Sir Hans Sloane *myrtus arborea aromatica foliis lauriniis*, by Linnæus *myrtus foliis alternis*.

"This spice, at first brought over for dietetic uses, has been long employed in the shops as a succedaneum to the more costly oriental aromatics: from them it was introduced into our hospitals, and is now received both in the *London* and *Edinburgh Pharmacopœias*."

The chief use of pimenta is as a spice, but a distilled water made therefrom has also been employed.

— PIPER (Pepper, Black Pepper)

Official in all editions of the *U. S. P.*, from 1820 to 1910.

Black pepper, *Piper nigrum*, is a perennial, climbing shrub, native to the forests of Malabar and Travancore, whence it was introduced to other tropical countries, such as Sumatra, the Philippines, West Indies, and the Malay Peninsula. It has been used as a spice and as a stomachic remedy by the natives of these and other countries since the date of the discovery of the remedy, and probably from all time preceding. Pepper was mentioned by Theophrastus (633), who described two kinds. Dioscorides (194) and Pliny (514) both give it a place in their writings. As early as 64 A. D. pepper was mentioned as occurring on the Malabar Coast. The Romans at Alexandria, A. D. 176, levied on it a duty. The Arabian authors of the 12th and 14th centuries described it fairly. In the European countries in the Middle Ages, pepper was considered the most important of all spices, being the foundation of much of the wealth of Venice and Genoa during their greatest commercial activity. It has been used as a medium of exchange when money was scarce, and

Digitized by Google

when Rome was besieged by the Goths the ransom included three thousand pounds of pepper. In fact, the value placed upon pepper in the records of the past is in itself an indication of its importance to the people who used it. We transcribe verbatim, in part, the exceptionally interesting history of piper given in Dymock's *Pharmacographia Indica*, pp. 167-8, as follows:

"Cosmas Indicopleustes, a merchant, and in later life a monk, who wrote about A. D. 540, appears to have visited the Malabar Coast, or at all events had some information about the pepper-plant from an eye-witness. It is he who furnishes the first particulars about it, stating that it is a climbing plant, sticking close to high trees, like a vine. Its native country he calls *Male*. The Arabian authors of the Middle Ages, as Ibn Khurdadbah (about A. D. 869–885), Edrisi in the middle of the 12th, and Ibn Batuta in the 14th century, furnished nearly similar accounts.

"Among Europeans who described the pepper-plant with some exactness, one of the first was Benjamin of Tudela, who visited the Malabar Coast in A. D. 1166. Another was the Catalan friar, Jordanus, about 1330; he described the plant as something like ivy, climbing trees and forming fruit, like that of the wild vine. 'This fruit,' he says, 'is at first green, then, when it comes to maturity, black.' Nearly the same statements are repeated by Nicolo Conti, a Venetian, who, at the beginning of the 15th century, spent twenty-five years in the East. He observed the plant in Sumatra, and also described it as resembling ivy.

"It is worthy of remark that all the foreign names for black pepper are derived from Pippali, the Sanskrit name for long pepper, which leads one to suppose that

Digitized by Google

the latter spice was the first kind of pepper known to the ancient Persians and Arabs, through whose hands it first reached Europe. Their earlier writers describe the plant as a shrub like the Pomegranate (*P. chaba?*). The moderns apply the name Filfil (Pilpil, *Pers.*) to all kinds of pepper. Black pepper is called in Sanskrit Maricha, which means a 'pungent berry.' The word is derived from Marichi, 'a particle of light or fire,' and appears to have been first applied to the aromatic berries known as Kakkola; it now signifies black and red pepper, and in the vernacular forms of Mirach or Mirchai, is a household word in India."

PODOPHYLLUM (Mandrake, Mayapple)

Official in all editions of *U. S. P.*, from 1820 to 1910.

This handsome plant, *Podophyllum peltatum*, known also as mandrake, or mayapple, is one of the most attractive features of the early spring in North America, resisting with remarkable efficiency the aggressive inroads of the agriculturalist. It was used by the North American Indians, the Cherokees employing the fresh juice of the root for deafness, and the Wyandottes as a drastic cathartic. Use of the juice in deafness has never been investigated. The once-celebrated "Indian Doctor," Peter Smith (605) and others of early date, employed the root as an escharotic, in which direction it came into early veterinary practice. American physicians and writers on medicine have generally praised its qualities as a purgative, its active cathartic nature having been known from the days of the Indians. The vegetable substitute for the once popular antimonial plaster used so freely by physicians during the period of vesication popularity was the "Compound Tar

Digitized by Google

Plaster" of the early botanics. This contained podophyllum, phytolacca, and sanguinaria. Concerning podophyllum, Buchan (110) comments as follows (1816):

"This plant is very common throughout North America. The fruit is esculent, and by many thought delicious. The leaves are poisonous. The root is an excellent purgative in doses of twenty grains. It is most advantageously used in combination with calomel, or crystals of tartar. The root, also, often operates as anthelmintic, and as such it is used by the Cherokee and other Southern Indians.

"The best time for gathering the Mayapple, for medical purposes, is in autumn, when the leaves have turned yellow, and are about falling off. The Indians dry it in the shade, and powder it for use."

King, in the first edition of the *American Dispensatory*, 1852, introduces podophyllum as follows:

"PROPERTIES AND USES.—Cathartic, emetic, alterative, anthelmintic, hydragogue, and sialagogue. It is equal, if not superior to jalap as a cathartic, and especially when in combination with bitartrate of potassa, it induces copious watery stools, on which account it has been found serviceable in dropsical affections. As a deobstruent, it is one of the most valuable in our materia medica, acting through and upon all the tissues of the system—and its action continues for a long time. . . .

"In constipation, podophyllum acts upon the bowels, without disposing them to subsequent costiveness."

Digitized by Google

RESINA PODOPHYLLI (Resin of Podophyllum)

First mentioned in the *Pharmacopeia* in the edition of 1860. Official in all later editions. The trade term, "*Podophyllin*," is first used in the edition of 1910, in which it appears as a secondary title, following *Resin of Podophyllum*.

DISCOVERY.—It has been erroneously stated, and the misstatement frequently repeated, (later writers probably copying from each other), that resin of podophyllum was discovered in 1831 by William Hodgson, Jr., and that this discovery was verified by Lewis, 1847. These were the first to investigate the rhizome of podophyllum, but the true history of their efforts may be briefly stated, as follows:

Hodgson, in 1831,[1] made an assay of the rhizome of *Podophyllum peltatum*, employing destructive chemical reagents and the heroic processes then prevailing. He obtained thereby, largely, decomposition products, but so far as any evidence was ever presented, Hodgson failed to isolate the natural energetic resinous constituent of podophyllum, afterward to become so conspicuous.

In 1847,[2] Mr. John R. Lewis again investigated the rhizome of podophyllum, and again applied too much chemistry (a fault not altogether lost, even yet), and obtained as a result a series of decomposition products, among which was one of a very slight cathartic action. If the resin were present in this substance, it existed in very small amount, the cathartic dose, as reported by Mr. Lewis, being *eight grains*.

Resin of podophyllum was discovered accidentally in 1835 by Dr. John King, then a young physician of the botanic school of medicine, and was then administered

[1] *American Journal of Pharmacy*, 1831, pp. 273-275.
[2] *American Journal of Pharmacy*, 1847, pp. 165-172.

Digitized by Google

by him with nearly fatal effects. Dr. King described this resin, which may be designated as "the resinoid forerunner," as it constituted the first American member of that list of substances, in the *Philosophical Journal and Transactions*, 1844, Vol. I, pp. 157-165.[1]

THE NAME.—The substance was introduced by Dr. King under the name, *Resin of Podophyllum*. He describes the process of its production as follows:

"I obtain only the resin, by extracting all that alcohol will take up, then filter the alcoholic tincture, to which I add an equal amount of water, and separate the alcohol by distillation—the resin sinks in the water."—*Western Medical Reformer*, 1846, p. 176.

Without materially altering the product, Dr. King afterward improved his process by evaporating the alcoholic tincture to a cream, pouring the residue into cold water and collecting the precipitated resin. Accepting that the substance he had discovered was a true resin, Dr. King applied to it the formal title, "*Resin of Podophyllum*," but when the substance came finally into general use, this title seemed too cumbersome.

COMMERCIAL INTRODUCTION.—In 1847, at the suggestion of Dr. John King, Dr. Wm. S. Merrell, a pharmacist then located at Court and Plum Streets, Cincinnati, prepared the resin, which he introduced to the medical and pharmaceutical professions under the terse term *Podophyllin*. It was the first of the so-called Eclectic resinoids. Considerable acrid controversy in the Eclectic ranks followed, in connection with the subject of "resinoids" and their names, as shown in the current pages of the *Worcester Journal of Medicine*

[1] See Bulletin No. 12, 1910, (Pharmacy Series No. 2), of the Lloyd Library of Botany, Pharmacy and Materia Medica, titled, *The Eclectic Alkaloids, Resins, Resinoids, Oleo-Resins and Concentrated Principles.*

Digitized by Google

(Worcester, Mass.), the *Western Medical Reformer*, (Worthington, Ohio), the *College Journal*, (Cincinnati), and the *Eclectic Medical Journal*, (Cincinnati). This controversy, which lasted until 1855, is probably long since forgotten by most persons, and is entirely unknown to those unacquainted with the actors, or with early Eclectic literature. It may be summed up, briefly, somewhat as follows:

The name "Podophyllin" was bitterly assailed by Dr. Squibb, who considered it "unfortunate that those whose aim should be to give accuracy and precision to matters connected with medical science and art, should so commonly refuse to this substance its proper and correct name, and adhere to the inaccurate and otherwise objectionable name of *podophyllin*." In this adverse view of the name Prof. Parrish concurred, saying,[1] "As well might the Calisaya extract of Ellis be called *quinia*, as the impure resinoid substance precipitated from a tincture of Mayapple, by the above process, *podophyllin*."

Dr. Merrell, who (as already stated) first brought to commercial notice the resin-like precipitate obtained by Dr. King's process, and who first used the term "podophyllin," ably defended that name, paralyzing his critics by the statement that "the term podophyllin had been suggested to him by Professor Wood, the author of the *United States Dispensatory*, who is no mean authority." Continuing his argument for the commercial term "podophyllin," Dr. Merrell says as follows:

"The names of the resinous principles, or resinoids, should be made to terminate in *in*, after the analogy of

[1] *American Journal of Pharmacy*, 1851.

Digitized by Google

the generic substance *resin* or *rosin*, and accordingly we should write *Podophyllin*, *Macrotin*, *Jalapin*, etc."

This method of nomenclature, suggested by Dr. Merrell, was accepted without question by the other makers of Eclectic remedies of that period, Hill, of Cincinnati, and Keith, of New York, each of whom placed upon the market a limited line of "resinoids," chief among which was "Podophyllin." From that date the name "Podophyllin" appeared as the trade name of this preparation, and after half a century has been accepted by the *U. S. Pharmacopœia* (1910), thus belatedly vindicating Dr. Merrell.[1]

To the above it may be added that the critics of the term "podophyllin" were themselves at fault, because the material is *not* a resin, but a mixture of substances. The present writer feels likewise at liberty to add that Dr. King, time and again, in conversation with him personally, lamented that not only had the name of this substance been the occasion for acrimonious discussion in Eclectic ranks, but that the discovery of the substance itself had been accompanied by an exceedingly trying and painful experience, resulting almost in professional disaster to himself. The incident had undoubtedly much to do with the unusual care exercised thereafter by Dr. King, both as a practitioner and as an author. This may be best described by giving, verbatim, a letter of Dr. King bearing upon the subject,[2] as follows:

[1] A process for the assay of podophyllin has been worked out by Mr. Charles G. Merrell, of Wm. S. Merrell & Co., a grandson of Dr. Wm. S. Merrell. This phase of the history of the drug will be considered at length in the volume now being prepared by Dr. Waldbott and Dr. Heyroth.

[2] Given with permission to publish same if so desired.

Digitized by Google

North Bend, Ohio, June 15, 1887.

PROF. JOHN U. LLOYD.

My Dear Sir,—At your urgent request, I will endeavor to give you a brief account of the discovery of the Resin of Podophyllum Root, more commonly known as "Podophyllin." My introduction to it was entirely accidental, and attended with very unpleasant circumstances.

In the fall of 1837,[1] I think it was, knowing nothing of this resin, an attempt was made to prepare a hydro-alcoholic extract from some forty pounds of the coarsely-powdered Podophyllum Root. A portion of alcohol having been distilled over from the root tincture, water was added to the remaining tincture, the intention being to evaporate this diluted tincture that a hydro-alcoholic extract might be had, but night coming on the process of evaporation was postponed until the following day. On the next morning, while stirring the cold mixture, numerous pieces of a dark, somewhat porous and rather brittle body, were found in the fluid. Many were the surmises as to what they were, and the query arose as to their value, if any, as a medicinal agent.

In the midst of these speculations, a young lady, about seventeen years of age, who was present, complained of feeling ill. Having no idea of the intense activity of the article just discovered, I administered about twelve or fifteen grains. Nothing further was thought of the matter until about an hour afterward, when my attention was called to her condition. She was in severe pain and distress, cramps in the stomach and extremities, pulse small and feeble, extremities cold, excessive vomiting and hypercatharsis, and ap-

[1] The date was earlier. Data, elsewhere recorded, show that it was as early as 1835—*L*.

Digitized by Google

parently sinking rapidly. Her condition greatly resembled that of a person suffering from a fatal attack of Asiatic cholera. To say that I was greatly alarmed would but feebly describe my mental condition. I ran to secure the aid of two or three professional friends, but could find none of them in their offices. Then I ran back again, trembling over what might be the consequences, and thinking out a course of treatment to pursue. A princely fortune could not induce me to undergo a repetition of such condition.

By the time I reached the patient, I had become more calm. A half-saturated, aqueous solution of potash saleratus was given, in tablespoonful doses, every ten minutes, several doses being administered before the stomach would retain it; subsequently, the intervals between the doses were lengthened. Sinapisms were applied to the wrists and ankles; a fomentation of bitter herbs, as hot as could be borne, was applied over the stomach and abdomen, changing it as often as required. In about an hour the extremities became warm, and a general perspiration soon followed, with diminishing suffering and a partial return to a feeling of health and strength. In about an hour or two succeeding the improvement, the sinapisms were removed, an infusion of slippery-elm bark was ordered to be drunk freely, and about eight grains of the Compound Powder of Ipecacuanha and Opium were given every three hours. The next morning she was decidedly better.

In the course of the second day, her friends allowed her to have a little soup, which was followed by a serious gastro-enteritic inflammation. The fomentations and sinapisms were repeated, and the Diaphoretic Powders continued, as well as the slippery elm infusion, to

Digitized by Google

which some prepared charcoal was added, not daring to prescribe a more active laxative. By perseverance in this course, the patient recovered in six or seven days, but, unfortunately, with some chronic gastro-enteritic abnormal condition, that remained for many years. From this experience I was so influenced, that I feared to use any of the remainder of the resin until, at least eighteen months had passed, when I ventured a repetition of its use, but in much smaller quantity, and with most excellent results.

There, my dear Professor, you have in a nutshell my discovery, which led to further investigations, resulting in the obtainment of more or less active principles, from other of our medicinal plants.

Yours with Respect,

JNO. KING, M. D.

A complete history of the discovery of *Resin of Podophyllum*, with detailed references to this and others of the "Eclectic resinoids," of which the foregoing is a brief résumé, may be found in *Bulletin No. 12* of the Lloyd Library.[1] In this are carried short biographies, accompanied by excellent portraits, of both Dr. John King[2] and Dr. William S. Merrell.

[1] See footnote, p. 251.

[2] In connection with his history of "Podophyllin," Dr. King speaks of "a princely fortune." It might be added that in his contribution of this substance, Dr. King gave to America and the world more than a princely fortune. To say that millions of dollars have come from this one substance to collectors, manufacturers, pharmacists and physicians, expresses but mildly a fact that could be verified by statistics. A neat monument, contributed by the Eclectic profession through "*The Right Side of the Car*," marks the tomb of King near his home at North Bend, Ohio. The life of Dr. King was in itself a contribution to the world of medicine, pharmacy, science, the land he loved, America, his ideal. In this the resin of podophyllum was but an incident. But for the encouragement of Dr. King, the writer of these lines could not have made his way in pharmacy, the Library in which these researches are now possible could not have been instituted.

Digitized by Google

PRUNUM (Prune)

Until 1910, from which it is dropped, Prunum is named in every issue of the *U. S. P.*, excepting the New York edition of 1830.

The cultivated varieties of the prune tree, *Prunus domestica*, or prune, are believed to descend from a wild prune, native to Greece, the shores of the Black Sea, and the Caucasus, reaching even into Persia. Pliny (514) records the fact that one of the numerous varieties of the plum tree known in his day afforded a laxative fruit. The pulp of the prune has been used in domestic medicine as well as by the medical profession, paralleling (or following), the efforts of those concerned in early medication. The pulp of the French prune was an ingredient of the once celebrated confection *Lenitive Electuary*. History does not record the beginning of the use of this fruit in the confection formerly so popular in domestic medicine.

PRUNUS VIRGINIANA (Wild Cherry)

Named in every edition of the *U. S. P.* In the first, 1820, (2d ed., 1828), it appears in the Secondary List. From 1830 it became fully official. *U. S. P.*, 1910, directs stem-bark of *Prunus serotina* (*Prunus virginiana*), the Wild Black Cherry Bark.

The *Prunus virginiana*, wild black cherry, found throughout the eastern parts of the United States, has been widely used in domestic medicine since the days of the Indian, being perhaps more highly valued in this direction than by members of the profession, although it has been recognized in the *Pharmacopeia* since the first edition of that work, 1820. No more popular bark of a native tree, excepting sassafras, is known to home medication, which gave it a place in all works on early American domestic medication. Its description and

Digitized by Google

uses by the American pioneers are admirably given by Buchan, (110), in *Every Man His Own Doctor*, as follows:

"The common wild cherry tree is often found in woods and hedges and is associated with the trees of the forest, growing to the height of forty or more feet and of a very large size. The gum which exudes from the tree is said to be equal to gum arabic. This tree produces in autumn a small bitter cherry, black when quite ripe, which serves for food for birds who frequently become intoxicated from eating them. They also are infused in brandy by the country people on account of the pleasant aromatic flavor which they impart to the liquor. The bark of the wild cherry tree is powerfully tonic, and has been frequently substituted for the Peruvian bark, with great success. It is slightly narcotic, and commonly produces a drowsiness in those who take it. From the experiments of Mr. C. Morris of Virginia, (*Inaugural Dissertation*, 1812, Phila.), it appeared that the bark of the root was more powerful than the bark of the trunk. It has been very useful in dyspepsia, and in consumption of the lungs. The Indians, it is said, use the bark in the cure of syphilis. Very excellent effects have been produced by washing ill-conditioned ulcers with a decoction of the bark, and the same has proved anthelmintic. The leaves of the tree are poisonous to certain animals. While this valuable tree abounds in the United States, we act unwisely, says Dr. Mease, in sending thousands of dollars out of the country for the Peruvian bark."

Digitized by Google

PYRETHRUM (Pyrethrum, Pellitory Root)

Official in 1820, 1828, and in the New York edition of 1830. It was dropped altogether from the Philadelphia edition of 1830. From 1840 to 1870 it was demoted to the Secondary List. From 1880 to 1910 it has been official.

Pellitory, or Spanish chamomile, *Anacyclus Pyrethrum*, is a widely distributed plant, known under different names in different countries. According to Pliny (514) it was the herb used by the "Magians" under the name *Parthenium* against intermittent fevers, and according to Dioscorides (194) it is the plant that, under the name *Anthemis*, was used in the same manner. It is found throughout European Turkey, and according to Forskal, southward to the mountains of Yemen, where it is called *mæniat*. According to De Candolle (122) its introduction into Britain was perhaps before the coming of the Romans. The European colonists carried it, according to Josselyn (345) to Northeast America before 1669, where it is to be found both under cultivation and, having escaped therefrom, as a wild plant. Once a popular remedy in agues, its use is now practically discontinued, even in domestic medicine. Physicians as a rule now neglect it, although it is employed by them in a few exceptional instances.

QUASSIA (Quassia)

Official in all editions of *U. S. P.*, excepting 1830, New York. The *U. S. P.*, 1910, officializes the wood of *Picrasma excelsa* (Jamaica Quassia of commerce), or of *Quassia amara* (Surinam Quassia of commerce).

Quassia amara takes its name from a slave of Surinam named Quassi, (see article "Quassia Amara," *Western Druggist*, (679a), Chicago, Jan. 1897), who used the plant as a secret remedy with great success in the treat-

Digitized by Google

ment of malignant fevers common to his locality and climate. Daniel Rolander, a Swede, became interested in the drug, and "in consequence of a valuable consideration," purchased from the slave Quassi a knowledge of the drug composing his remedy. Rolander returned to Stockholm in 1756, when he introduced the drug to Europe. In 1760 or 1761 Carol. Gust. Dahlberg, an officer of the Dutch army and an eminent botanist, a pupil of Linnæus (385), returned to Sweden from Surinam, where he too had become acquainted with the slave Quassi, and through kindness to him had so gained his affection that he revealed not only the composition of his secret remedy, but even showed to him the tree from which the drug was derived. Dahlberg procured specimens of the root, flowers and leaves of the tree, preserving them in alcohol, and presented them to Linnæus, who named the wood *Lignum quassiæ*, in honor of the slave, and established a new genus for the plant, which he named *Quassia amara*. The drug was brought to the notice of the medical profession by Linnæus' lectures on materia medica, as well as through a dissertation written under his direction, in 1763, by one of his pupils, Carolus M. Blom. Rather more than a questioning, however, seems to exist, as to the exact plant employed by the slave Quassi. As pointed out by Dr. Wright, the leaves pictured in the Linnæan Dissertation belonged to another species than the *Quassia amara*, an error corrected by the younger Linnæus.

In this connection it may be stated that Philippe Fermin, a French physician and traveler in Surinam, spelled the name of the slave *Coissi*, questioning somewhat the fact of his having discovered the uses of the

Digitized by Google

remedy, which Fermin states had been used in Surinam as early as 1714. It may also be noted that, according to Murray, a spice dealer of Amsterdam, Albert Seba, is said to have had in his collection a specimen of a bark of a tree named *quasci* as early as 1730. Be this as it may, the drug known as quassia under the empirical introduction given by the native of Dutch Guiana became known to European civilization, and in 1788 became official in the *London Pharmacopeia*. Concerning the origin of the drug, the *German Pharmacopeia*, 1872, demanded that the wood employed be that of *Quassia amara*. In the second edition, 1882, that of *Picræna excelsa* was concurrently admitted. Either species furnishes the official quassia of the present *Pharmacopeia of the United States*.

QUERCUS (White Oak)

Official, from 1820, until the 1910 edition, from which it is dropped.

The bark of the oak, *Quercus alba*, is strongly astringent, and has ever been used in domestic medicine where an astringent material is applicable, as for example, in dysentery, hemorrhages, etc. In the form of a poultice, a decoction and as a tincture, it has a domestic record, probably common to other species of oak, in all countries. The medical profession has added little, if anything, to the domestic uses of quercus, as recorded by Rafinesque (535), Porcher (520), Cutler (178), and the early American dispensatories and works on materia medica. From the first edition of Professor King's *American Dispensatory*, 1852, we extract as follows:

"Externally, a decoction of quercus forms an excellent

Digitized by Google

gargle for relaxed uvula and sore throat, a good stimulating astringent lotion for ulcers with spongy granulations, and an astringent injection for leucorrhea, prolapsus ani, hemorrhoids, etc. A poultice of the ground bark has often proved of service in gangrene and mortification.

"In sickly, debilitated children, and in severe diarrheas, especially when the result of fevers, the decoction given internally, and used as a bath to the body and limbs, two or three times a day, will be found very efficacious. When given for diarrhea or dysentery, it should be combined with aromatics, and sometimes with castor oil. A bath is often advantageous in some cutaneous diseases. The green bark of elder and white oak, bruised together, or in strong decoction, forms a very useful and valuable application to abrasions."

QUILLAJA (Quillaja, Soap Bark)

Named only in the *U. S. P.'s* from 1880 to 1900. Dropped from 1910.

Quillaja Saponaria, soapbark, named by Molina (444) in 1782 in his *History of Chili*, is the bark of a South American tree, having similar qualities to other soap weeds or barks, derived from various plants and trees, and used by the natives of different countries as a substitute for soap, or rather as a material for purposes similar to those of soap. Among the first contributions to the literature of saponaria is that of Henry, Jr., and Boutron Charlard, *Amer. Journ. of Pharm.*, 1841, p. 209, (17b), in which the now well-known acrid, frothing qualities of the drug are mentioned, the statement being that the name originated from the Chilean term *quilloan, to wash.* In the *American Medical Intelligencer*, Sept. 15, 1840, Dr. Ruschenberger, of the

Digitized by Google

United States Navy (*Am. Journ. Pharm.*, 1841), contributes an article on this bark which, according to his observations in Chili, 1827, was used principally for cleansing purposes. Dr. Ruschenberger returned from Chili in 1829 with specimens of the bark, stating that as late as 1833 the extract had not been used in Valparaiso, although in 1835 Dr. J. Stiles, of Valparaiso, was authority for the statement that at that date the extract had been made in that city and was being used experimentally. The natives of South America employ an infusion of quillaja as a wash, which led Dr. Ruschenberger to say: "From what I have seen of the effects of this cold infusion, I should be disposed to give it a trial as an injection in leucorrhea, with the expectation of very favorable results." The nature of quillaja, so nearly resembling the acridity of senega, led to the expectation that it would parallel that drug in its remedial qualities in the direction of coughs and pulmonary affections. It has not, however, become a favorite, other than as a producer of suds and as a frother for syrups, in which direction the extract has been employed in the making of the popular American beverage, the so-called *soda-water*, a use of quillaja that the Government has now wisely prohibited.

RHAMNUS PURSHIANA (Cascara Sagrada)

(See also Frangula)

Rhamnus catharticus (buckthorn berries) was official in 1820, 1828 (2d ed. of 1820), and the New York edition of 1830. It was then dropped altogether until 1890, when *Rhamnus Purshiana* was made official, with the secondary title, Cascara Sagrada. The 1900 edition followed that of 1890. In 1910 the title *Cascara Sagrada* was made official, *Rhamnus Purshiana* being mentioned only as the botanical name of the tree yielding the drug.

Rhamnus, buckthorn, is of wide distribution. The variety *catharticus*, formerly used in medicine, prevails

Digitized by Google

over Northern Africa, most of Europe, the Caucasus, and into Siberia. In some instances it becomes almost a small tree, Flückiger (240) having a specimen eight inches in diameter. Before the Norman Conquest buckthorn was known as a laxative, under the name *Waythorn* or *Hartshorn*. The Welsh physicians of the 13th century (507) prescribed a preparation of the berries under the name Syrup of Buckthorn, a title that still prevails. This syrup, aromatized, became official in the *London Pharmacopeia*, 1650.

Rhamnus Purshiana.—The present official drug of the *Pharmacopeia*, *Rhamnus Purshiana*, is not only related botanically to the earlier variety, but it is therapeutically similar, being laxative in small doses and cathartic in large doses. The tree (*R. Purshiana*), is distributed over the mountain ranges of the western Pacific states, being most abundant in California and Oregon. Possibly collectors do not always distinguish between this species and *Rhamnus californica*. To the settlers of the west it has long been known as "Chittim wood," and by them an infusion of the bark is used as a cathartic.

Dr. J. H. Bundy (111a), of Colusa, California, impressed with its value, brought the bark, under the name *Cascara Sagrada*, to the attention of Parke, Davis & Co., of Detroit, Michigan. This firm introduced it in 1877, through the columns of their publication, *New Preparations*, (467), 1877 and 1878.

The remedy became a great favorite, and within a reasonable time was in demand throughout the civilized world, becoming official in the *Pharmacopeia of the United States* in 1890. The remarkable record of rhamnus has been a subject of many contributions to botanical and therapeutic literature, and much of

Digitized by Google

RHAMNUS PURSHIANA (CASCARA SAGRADA) (Page 263)

Upper. CASCARA SAGRADA BARK

Lower, left. CUTTING THE TREES. *Lower, right.* TREES BARKED

Presented by Parke, Davis & Company.

Digitized by Google

Digitized by Google

interest concerning it remains yet unwritten. To this writer its journey from the aborigines to scientific use and systematic therapeutic study appears to parallel the course of such drugs as coca, jalap, benzoin, sassafras, cinchona and *Croton Tiglium*.

A descriptive treatise, recording some previously unwritten phases of the dramatic history of rhamnus, familiar only to those concerned in its introduction, was contributed by this writer,[1] in 1896, to the Research Committee of the American Pharmaceutical Association. From this we take the following brief summary:

"In a paper contributed to *New Preparations*,[2] October 15, 1877, p. 8, the late Dr. J. H. Bundy, of Colusa, California, commended 'Cascara Sagrada' as a valuable remedy in the treatment of constipation. This notice was by means of a brief note that was part of a paper on *Berberis aquifolium*, Dr. Bundy promising, however, to give the subject further attention later. Dr. Bundy says:

"It is not my purpose to treat on Cascara Sagrada in this paper, but using it in connection with the Berberis, I simply make mention of it. In the future I will introduce the drug to the profession."

This, so far as the writer can determine, was the first reference concerning this remedy in pharmaceutical or medical print. Agreeably to promise, in January, 1878, Dr. Bundy contributed to *New Preparations* a paper on "Cascara Sagrada," in which he gave the uses of the fluid extract of that remedy. Following this came many papers from Dr. Bundy and other physicians, twenty contributions on the subject being printed in *New*

[1] Introductory to a contribution from chemical investigations of *Rhamnus Purshiana*, undertaken by Alfred R. L. Dohme (175a).

[2] *New Preparations*, Detroit, Mich. Parke, Davis & Co. (467).

Digitized by Google

Preparations, 1878, the subject being confined to this publication during 1877 and 1878. Dr. Bundy stated in his paper, 1878, as follows: "A description of the Cascara I am unable to give at this time, but suffice it to say that it is a shrub, and in due time its botanical name will be known." Dr. Bundy neglected, however, to concern himself further in the matter.

In the fall of 1878, Dr. C. H. Adair, of Colusa, California, a partner of Dr. Bundy, sent to this writer specimens of the bark, and botanical specimens of the tree yielding it. These were identified by Mr. Curtis G. Lloyd as *Rhamnus Purshiana*. This fact was announced in a paper titled "Some Specimens of Western Plants," presented to the American Pharmaceutical Association at its meeting in Atlanta, Georgia, November, 1878, (*Proceedings*, 1879, p. 707), and completed the drug's history.

NAMES.—Dr. Bundy supplied the drug under the Spanish name "Cascara Sagrada," a term said to have been in local use throughout some sections of California. This came to be the common name of the drug, and will surely dominate all others as long as the drug is in use. The anglicized name, "*Sacred Bark*," has also been applied to the drug, the Scriptural term "Chittim bark" being also employed in early days in some parts of California. These last names are now obsolete.

At the present date, this drug is employed in every civilized country and is recognized in medical, pharmaceutical, and chemical literature the world over. To give detailed references to it would require a volume in space.

The pharmacy and chemistry of cascara sagrada is now voluminous, its record lying in the field of

Digitized by Google

Dr. Waldbott and Prof. Heyroth. References thereto are recorded in the contribution of Dr. Dohme (*Proc. Amer. Pharm. Assn.*, 1897, pp. 193–202), entitled "The Chemistry of Cascara Sagrada," together with references to works of previous investigators. Dr. Dohme's results are not susceptible of satisfactory condensation, especially as he includes and contrasts therewith constituents obtained from buckthorn. In 1898, in connection with Dr. Hermann Engelhardt, Dr. Dohme continued the study of cascara sagrada, under the title "The Bitter Principle of Cascara Sagrada," announcing that it was but a preliminary contribution that would be continued in the future. (See *Proc. Amer. Pharm. Assn.*, 1898, p. 340, 341). Although our study is restricted to crude drug history, the innovation made in the direction of the articles by Dr. Dohme concerning the structures of these two drugs can not come amiss to one concerned in the subject as a whole.[1]

RHEUM (Rhubarb)

Official in all editions of the *U. S. P.*, from 1820 to 1910. The 1910 edition makes official the rhizome and roots of *Rheum officinale*, *Rheum palmatum* and variety *tanguticum*, and probably "other species of *Rheum* grown in China and Thibet."

Rheum officinale, rhubarb, is a gift of the Chinese, who from all times have used it in domestic practice, as noted in the herbal *Pen-king*, (about 2700 B. C., *Dymock*), probably the production of the Emperor Shennung, the "father of Chinese agriculture and medicine." (Flückiger). As exported from its home in China, it has been known respectively as Russian, Turkish and Chinese rhubarb, in accordance with the country

[1] See "Monographs from the Research Laboratory of Sharp and Dohme, The History, Pharmacognosy, and Chemistry of Cascara Sagrada."

Digitized by Google

through which it reached the market from its native land. As a drastic cathartic and a laxative this drug is used in large amounts, having been long accepted as a household remedy in syrup and tincture form the world throughout. Rhubarb is one of the great gifts of empiricism to the medical profession. Flückiger naturally gives this drug detailed care, as is true also of Dymock, in his *Pharmacographia Indica*. From these two great publications we condense as follows:

"HISTORY.—In the great Geography of China it is stated that rhubarb was a tribute of the province Sining-fu, from about the 7th to the 10th centuries of our era.

"As regards Western Asia and Europe, we find a root called ῥᾶ or ῥῆον, mentioned by Dioscorides as brought from beyond the Bosphorus. The same drug is alluded to in the fourth century by Ammianus Marcellinus, who states that it takes its name from the river Rha (the modern Volga), on whose banks it grows. Pliny describes a root termed *Rhacoma*, which when pounded yielded a colour like that of wine but inclining to saffron, and was brought from beyond Pontus.

"The drug thus described is usually regarded as rhubarb, or at least as the root of some species of *Rheum*, but whether produced in the regions of the Euxine (Pontus) or merely received from remoter countries, is a question that can not be solved.

"It is, however, certain that the name *Radix pontica* or *Rha ponticum* used by Scribonius Largus and Celsus was applied in allusion to the region whence the drug was received. Lassen has shown that trading caravans from Shensi in Northern China arrived at Bokhara as

Digitized by Google

early as the year 114 B. C. Goods thus transported might reach Europe either by way of the Black Sea, or by conveyance down the Indus to the ancient port of Barbarike.

"The terms *Rheum barbarum* or *Reu barbarum* occur in the writings of Alexander Trallianus about the middle of the 6th century, and in those of Benedictus Crispus, archbishop of Milan, and Isidore of Séville, who both flourished in the 7th century. Among the Arabian writers on medicine, the younger Mesuë, in the early part of the 11th century, mentions the rhubarb of China as superior to the *Barbaric* or Turkish. Constantinus Africanus about the same period speaks of Indian and Pontic *Rheum*, the former of which he declares to be preferable. In 1154, the celebrated Arabian geographer Edrisi mentions rhubarb as a product of China, growing in the mountains of Buthink—probably the environs of northeastern Tibet near Lake Tengri Nor.

"Rhubarb in the 12th century was probably imported from India, as we may infer from the tariff of duties levied at the port of Acon in Syria, in which document it is enumerated along with many Indian drugs. A similar list of A. D. 1271, relating to Barcelona, mentions *Ruibardo*. In a statute of the city of Pisa called the Breve Funda-cariorum, dating 1305, rhubarb (*ribarbari*) is classified with commodities of the Levant and India.

"The first and almost the only European who has visited the rhubarb yielding countries of China, is the famous Venetian traveller, Marco Polo, who speaking of the province of Tangut, says: 'Among all the moun-

Digitized by Google

tains of this province, rhubarb (*reobarbe*) is found in great abundance. And merchants buy it, and carry it all over the world.'

"The risk and expense of the enormous land-transport over almost the whole breadth of Asia, caused rhubarb in ancient times to be one of the very costly drugs. Thus at Alexandria in 1497, it was valued at twelve times the price of benzoin. In France, in 1542, it was worth ten times as much as cinnamon, or more than four times the price of saffron. At Ulm, in 1596, it was more costly than opium. A German price-list of the magistrate of Schweinfurt, of 1614, shows *Radix Rha Barbari* to be six times as dear as fine myrrh, and more than twice the price of opium. An official English list giving the price of drugs in 1657, quotes opium as 6s. per lb., scammony 12s., and rhubarb 16s." (Flückiger and Hanbury, *Pharmacographia*, pp. 493, 4 and 6.)

"*Riwas* (the plant Ri in the Zend language), was known to the ancient Persians, and the same name is still applied to a species of Rheum in the province of Gilan in Persia. Aitchison found *R. Ribes*, Gronov., on the Paropamisus range, to be known to the peasantry as Rewash, Rewand and Chukri; he states that the flowering branches are eaten, and the root used in coloring leather. In the Hari-rud Valley he found *R. tataricum*, Linn., to be known as Rewash-i-dewana, 'fool's rhubarb,' the fruit and root being used as a purgative. Ibn Sina notices both the plant Ribas (Riwas, *Pers.*) and the drug Rawand, the first an acid plant, and the second evidently Chinese rhubarb. Mesuë, early in the 11th century, distinguishes between Chinese and Khorasan rhubarb, and Haji Zein-el-attar, writing in 1368, says: 'I consider Rewand to be the same as Ribas.

Digitized by Google

Ibn Jazla, author of the Minhaj, states that there are two kinds, China and Khorasan rhubarb, and that the latter is known as Rawand-el-dawabb, and is used in veterinary practice, whilst the Chinese is reserved for human beings. The latter is the best kind, and, when powdered, is of a saffron color; the fractured surface has the grain of a cow's hump, and is friable; it is called "meaty rhubarb," and should be in large pieces like a horse's hoof, and not worm-eaten. In my experience there are three kinds of rhubarb, Chinese, Khorasan, and Indian. Mesuë states that rhubarb is hot in the third degree and dry in the first.'

"Rhubarb is not an article of the Hindu Materia Medica, but the modern Hindus have become acquainted with its properties through Mahometan and European physicians." (Dymock, *Pharmacographia Indica*, v. 3, pp. 153–4.)

The botanical history and description of the rhubarbs is of great interest, but out of place in this publication. We venture to suggest that no greater service could be offered our members, or greater credit given our society, than a special volume devoted wholly to the botanical relatives of Pharmacopeial drugs, by the American botanical authorities, H. H. Rusby or Henry Kraemer.

RHUS GLABRA[1] (Sumach)

As *Rhus glabrum*, this appears in the *Pharmacopeia*, from 1820 to 1870, inclusive, but in the Secondary List only. It was official in the editions of 1880 and 1890, but was dropped from the edition of 1910.

Sumach, *Rhus glabra*, is found in most of the temperate parts of the United States, to which country it is

[1] *Rhus Toxicodendron* (*Poison Ivy, Poison Oak*), was recognised by all the *Pharmacopeias* (even the *Pharmacopeia of the Massachusetts Medical Society*, 1808), until the edition of 1900, from which it was dropped. Previous to the year 1880 it was known under the name *Toxicodendron*, but appeared in the Secondary List only.

Digitized by Google

indigenous. It was extensively used by the Indians, who used the powdered seeds to treat piles and as application to wounds, and the juice of the fresh fruit for warts, and in treatment of skin diseases like tetter. In domestic medicine the berries were also employed, in a decoction, as a gargle in quinsy, ulceration of the mouth and throat, and as a wash for ringworm, tetter and offensive ulcers. These well-known uses of the American plant, which is so ornamental after the frost strikes its leaves in the fall, led to its introduction into professional medicine. In Turkey, as this writer was informed while in that country, the berries of sumach are used in instituting the ferment of their popular curd food.

— ROSA GALLICA (Red Rose)

The rose is mentioned in all editions of the *Pharmacopeia*, from 1820 to 1910, inclusive. In the early editions, 1820 and 1828, the variety *Rosa centifolia*, alone, is named. From 1830 to 1890, the *red* and the *pâle rose* are given equal prominence. In the editions of 1900 and 1910, *Rosa gallica* alone is named, the variety *centifolia* being dropped.

The rose, in some form of its many varieties, is indigenous to the warmer parts of Europe, Asia Minor, the Caucasus, and other countries. Its use in medicine, as well as in perfumes, dates from the earliest times. The *Rosa gallica* is said to have been introduced into France in 1241 by the Count of Champagne, on his return from the Crusades. In the study of "attar of roses," made by the present writer on the bottom lands beneath Mt. Olympus, near Brussa, in Turkey, he found the roses planted in rows, appearing much like fields of raspberries. The flowers were of a rather insignificant appearance, but very fragrant. The process employed in the distillation of the oil, as well as the

Digitized by Google

ROSA GALLICA, Page 272 (No. 3)

Upper. TURKS IN ROSE FIELD, NEAR BRUSSA

Lower. ROSE WATER STILL, NEAR BRUSSA

Photographed by John Uri Lloyd.

Digitized by Google

Digitized by Google

ROSA GALLICA, Page 272 (No. 4)

Upper. FRONT VIEW, ROSE OIL STILL, NEAR BRUSSA

Lower. BACK VIEW, ROSE OIL STILL, NEAR BRUSSA

Photographed by John Uri Lloyd.

Digitized by Google

Digitized by Google

apparatus, was of the crudest. A copper-bottomed still of tin, having a capacity of about fifty gallons, was heated at its bottom by a direct, charcoal furnace. From the top of the still a tin pipe ran horizontally along a rude trough about fifteen feet in length, filled with very cold, running water, supplied in abundance from the springs of Mt. Olympus, this being raised by means of an undershot water wheel, about eight feet in height and two feet in diameter, with paddles on the extremities of the arms. To the ends of these paddles were affixed tin cans, holding about a quart each. These were submerged, successively, as the wheel turned slowly, in a lower trough supplied with running water, and on rising they poured their contents into the upper trough, carrying the pipe from the still. The vapor from the still was thus condensed, the rose oil separating from the water of distillation, which was used over and over, with fresh lots of rose petals. By this rude process two kinds of rose oil were made by the Turkish owner of the gardens, one from white, the other from red roses, their colors being respectively a light yellowish, and a reddish. The oil from each congealed at ordinary temperatures. Specimens of the oils then procured are yet in my possession, seemingly as fragrant and as sweet as when first made.

The use of the rose in confection form, in pharmacopeial medicine, once very popular, has, with the exception of its employment in "blue mass," *Massa Hydrargyrum*, become nearly obsolete. In the "*Arabian Nights*," (88), rose water is often mentioned. In Turkish home life, it is employed as a refreshing perfume after bathing. The wife and daughters of the writer, in the summer of 1906, were entertained at the home

Digitized by Google

of a reigning Bey in the interior of Turkey, near the site of the ancient city of Sardis. The following is a brief account of their reception:

"On entering the home, a change in shoes is made, the street shoes being left outside the door. In the vestibule of the harem, on a stand, is found a large empty bowl with a perforated silver top. We extended our hands over this bowl, and a servant poured over them water, with which we bathed first the hands and then the face. A long Turkish towel was then handed us, and afterwards an attendant sprayed our faces and hands with *rose water*. We were then presumed to be refreshed, and ready to enter the home."

This use of rose water by Oriental ladies dates from the very earliest period. From the same section of the Orient we find it recorded in Rimmel's *Book of Perfumes*, 1867, as follows:

"Rose-water is still held in high repute in the East, and when a stranger enters a house, the most grateful token of welcome that can be offered to him is to sprinkle him over with rose-water, which is done by means of a vessel with a narrow spout called *gulabdan*. It is to this custom that Byron alludes in *The Bride of Abydos*, when he says—

'She snatched the urn wherein was mix'd
The Persian Atar-gul's perfume,
And sprinkled all its odours o'er
The pictured roof and marbled floor.
The drops that through his glitt'ring vest
The playful girl's appeal address'd,
Unheeded o'er his bosom flew
As if that breast was marble too.'

Digitized by Google

"Niebuhr, in his '*Description of Arabia*,' mentions likewise this habit of throwing rose-water on visitors as a mark of honour."

Nor did Moore overlook this queen of flowers. In his poem, *Lallah Rookh*, frequent reference is made thereto, of which the following will serve as an illustration:

"The floweret of a hundred leaves,
Expanding while the dew-fall flows,
And every leaf its balm receives."

The legend of Tristram and Iseult beautifully illustrates the springing of a sprout of ivy from the grave of each, to twine together when "it met its fellow at the crown of the vaulted roof and there clasped it as only ivy can." The same conception is found in the old ballad of *Fair Margaret and Sweet William*, which appears in many variations, from one of which we extract as follows:

"Margaret was buried in the low chancél
And William in the higher;
Out of her breast there sprang a rose,
And out of his a briar."[1]

In *Gulistan*, (meaning, *Garden of Roses*), said to be the finest poem ever written in the Persian language, the author, Sadi, explains his motives for giving this name to his work, as follows:

"On the first day of the month of Urdabihisht (May), I resolved with a friend to pass the night in my garden. The ground was enamelled with flowers, the sky was lighted with brilliant stars; the nightingale sang its

[1] See *The Sacred Tree, or The Tree in Religion and Myth*, by Mrs. J. H. Philpot, 1897.

Digitized by Google

sweet melodies perched on the highest branches; the dew-drops hung on the rose like tears on the cheek of an angry beauty; the parterre was covered with hyacinths of a thousand hues, among which meandered a limpid stream. When morning came my friend gathered roses, basilisks, and hyacinths, and placed them in the folds of his garments; but I said to him, 'Throw these away, for I am going to compose a Gulistān (garden of roses), which will last for eternity, whilst your flowers will live but for a day.'" (*Book of Perfumes*, Rimmel, p. 129.)

— RUBUS VILLOSUS (Blackberry)

Rubus villosus has been official in every edition of the *U. S. P.* until 1910, when it was dropped. In the early editions, from 1820 to 1850, it was mentioned along with *Rubus trivialis*, (Dewberry), in the Secondary List. In 1860 dewberry was dropped, *Rubus vill.* being promoted to the Primary List, retaining its official position until 1910. In 1880 and 1890, the variety *Rubus Idæus* (Raspberry), was also official, but was then dropped.

Blackberry, *Rubus villosus*, grows abundantly in most parts of the United States. The roots of the various species as well as varieties are more or less astringent, and have been used in domestic medicine from the days of America's first settlement. The Cherokee Indians, (Rafinesque), (535), chewed the root of this plant and swallowed the saliva for treatment of cough, its astringency being probably helpful to the throat membranes. They also used a poultice of rubus for the piles, in which direction its mild astringency seems rationally to adapt it. A syrup of blackberry root has ever been a great favorite in some sections of the country as a remedy for dysentery. This use of rubus in domestic medication, in which it has always been valued in America, led finally to its em-

Digitized by Google

ployment by the members of the medical profession. The juice of the blackberry fruit, spiced and mixed with whiskey, has ever been a valued carminative drink in Kentucky and other parts of the Southern United States, and founded the well-known "Blackberry Cordial."

SABAL (Saw Palmetto)

Official only in the *Pharmacopeias* of 1900 and 1910.

The berry of the saw palmetto, *Serenoa serrulata*, (*Sabal serrulata*), practically unknown in medicine before 1879, came rapidly into conspicuity after that date, in both pharmacy and medicine. It had been observed by the settlers of the South that animals feeding on the matured fruit "grew very sleek and fat," a fact ascribed to the therapeutic qualities of the berries, and reasoning from this, they prepared a decoction of the fruit for domestic medication.[1] In 1877, Dr. Reed, of the Southern United States, in an article titled "A New Remedy," in the *Medical Brief*, (417), St. Louis, stated that several persons in his neighborhood were using a preparation of the berry, giving instances of its use in various directions. This article was reproduced in *New Preparations* (467), July, 1879, and was followed in the same publication by another article from the *Medical Brief*, in which Dr. I. J. M. Goss, then of Marietta, Georgia, stated that he had been induced to use the remedy and considered it satisfactory. After this introduction the drug came repeatedly to the attention of physicians. Manufacturing pharmacists gave it especial attention, and at the present time it is one of the most important remedial products of the South. Thus the experimenta-

[1] Since ripe saw palmetto berries contain much fixed oil it might also be inferred that the *food* side of the subject should not be overlooked.—*L.*

Digitized by Google

tion of the people, following its apparent effect on animals, was in turn followed by the investigations of physicians, the remedy being finally introduced to the pages of the *Pharmacopeia*. In our opinion, the volatile oil and its decomposition products are of exceeding interest. These substances have been for some years under the investigation of Professor Edward Kremers, of the University of Wisconsin.

SABINA (Savin, Juniper)

Official in all editions from 1820 to 1900. Dropped from *U. S. P.* in 1910 edition.

Sabina, *Juniperus Sabina*, is native to the mountainous portions of Austria, Switzerland, and some parts of France. It is also found in the Pyrenees, Italy, the Caucasus, and other countries in regions far above the sea level, and in the northern parts of North America. Sabina was used in veterinary medicine, as mentioned by Marcus Porcius Cato (132), a Roman author, 200 B. C. It was also known to Dioscorides (194) and to Pliny (514). The early domestic "leech books," before the Norman Conquest, gave a place to sabina, and Charlemagne ordered that it should be planted on the imperial farm. Macer Floridus (397), in the 10th century, commended the use of sabina in wounds and ulcers. For the uses of this drug, see any of the early Materia Medicas or Dispensatories.

SACCHARUM (Sugar)

Official in all editions of *U. S. P.*, from 1820 to 1910. The *U. S. P.*, 1910, names sucrose from *Saccharum officinarum*, *Beta vulgaris* var. *Rapa*, and other sources.

The sugar-cane, *Saccharum officinarum*, is cultivated in all tropical countries, such as India, China, Mexico, and the West Indies, its native land being probably

Digitized by Google

India or the Indo-Chinese countries and islands. As made from the cane, sugar has been known from time immemorial. It is mentioned by such early writers as Theophrastus (633) and Herodotus (314a), and others, who knew raw sugar as *honey of canes*, and in the early Christian era sugar became well known under the name *saccharon*. Dioscorides, 77 A. D., describes it as obtained from India and Arabia Felix, stating that in brittleness, it resembled salt. Pliny mentions it under the name *saccharum*, and an unknown writer, 54–68 A. D., mentions it as an article of import to the ports of the Red Sea opposite Aden. (For description of that country, see Burton's *First Footprints*) (113), but it is doubtful whether it was brought from the eastern or western parts of India. It is mentioned by Abu Zayd al Hasan (240), 850 A. D., as produced on the Persian Gulf, and in 950 A. D., Moses of Chorene states that it was then manufactured in quantities. Sugar was introduced into medicine in the 10th and 11th centuries by Rhazes, a physician of Persia, who died about 923 A. D., Haly Abbas (295) and others; but it had ever been employed, as it is still employed, in domestic medicine for the purpose of disguising unpleasant materials, and for sweetening acrid substances. Burton (113) found crude sugar an article of domestic use by several tribes of native Africans. As a remedy in itself, sugar has been quite often a therapeutic factor in both domestic and regular medicine. The value of sugar as a food was scarcely appreciated before the middle of the 19th century, it being generally accepted as a "sweetener," pleasant to the taste, especially with children. At the present time, 1918, sugar is recognized as one of the most important foods.

Digitized by Google

Dymock naturally makes a close study of the Oriental history of saccharum. We take pleasure in quoting, as follows.

"HISTORY.—If the wild form of the sugar-cane is to be anywhere now met with, it is in India, of which country it is undoubtedly a native, and where it has been cultivated from the earliest antiquity. Whether the species grown in China is specifically the same, is scarcely determined with certainty, but it is probably native to that country. The Sanskrit name of the plant is Ikshu, and it is also called Guda-trina, 'the grass from which guda is made,' and Guda-daru, etc., from the juice (Ikshurasa); the ancient Hindus prepared an extract by boiling, which, when soft and sticky, was called Ikshurassa-kvatha, Phanita, and Guda, but when allowed to drain and become dry, was known as Guda-sarkara, Khanda or Khanda-sarkara, and Matoyandika. Twelve varieties of sugar-cane are mentioned by Sanskrit writers, but in this number are probably included other grasses belonging to the genera Saccharum, Sorghum, etc. The root of the sugar cane is also used in Hindu medicine, and is considered to have demulcent and diuretic properties. A kind of rum was also obtained by the ancient Hindus from the juice of the cane or from *guda* and water fermented, which was known as Sidhu and Ganda." (Dymock, *Pharmacographia Indica*, v. 3, p. 593.)

~ SALVIA (Sage)

First mentioned in *U. S. P.* in 1840, but in Secondary List, which position it held in 1850. It was transferred to the Primary List in 1860, and remained official until 1900. It was dropped in 1910.

Sage, *Salvia officinalis*, has been used by the herbalists from all time, being likewise employed as a

Digitized by Google

flavor in culinary directions. Pliny (514), Theophrastus (633) and other early writers mention this plant, which is now cultivated in all temperate regions of the world. It is still employed in decoction as a domestic medicinal drink, and when bruised, the fresh herb is applied as a poultice to sprains and swellings. Its empirical use antedates its employment in systematic medicine. The uses of sage in domestic medicine in England, with its history in that direction, are given in Culpeper's *Complete Herbal*, 1653, (175). Note that the use of sage to darken the hair is there recorded. Let us extract from this work, as follows:

"GOVERNMENT AND VIRTUES.—Jupiter claims this plant, and bids me tell you, it is good for the liver, and to breed blood. A decoction of the leaves and branches of Sage made and drank, saith Dioscorides, provokes urine, brings down women's courses, helps to expel the dead child, and causes the hair to become black. It stays the bleeding of wounds, and cleanses foul ulcers. Three spoonfuls of the juice of Sage taken fasting, with a little honey, doth presently stay the spitting or casting of blood of them that are in a consumption.

"Matthiolus saith, it is very profitable for all manner of pains in the head coming of cold and rheumatic humors: as also for all pains of the joints, whether inwardly or outwardly, and therefore helps the falling-sickness, the lethargy such as are dull and heavy of spirit, the palsy; and is of much use in all defluctions of rheum from the head, and for the diseases of the chest or breast.

"Pliny saith, it procures women's courses, and stays them coming down too fast: helps the stinging and biting of serpents, and kills the worms that breed in the

Digitized by Google

ear, and in sores. Sage is of excellent use to help the memory, warming and quickening the senses; and the conserve made of the flowers is used to the same purpose, and also for all the former recited diseases. The juice of Sage drank with vinegar, hath been of good use in time of the plague at all times. Gargles likewise are made with Sage, rosemary, honey-suckles, and plantain, boiled in wine or water, with some honey or allum put thereto, to wash sore mouths and throats, cankers, or the secret parts of man or woman, as need requires. And with other hot and comfortable herbs, Sage is boiled to bathe the body and the legs in the summer time, especially to warm cold joints, or sinews, troubled with the palsy and cramp, and to comfort and strengthen the parts. It is much commended against the stitch, or pains in the side coming of wind, if the place be fomented warm with the decoction thereof in wine, and the herb also after boiling be laid warm thereunto."

SANGUINARIA (Bloodroot)

Official in every edition of the *Pharmacopeia*, from 1820 to 1910.

Bloodroot, *Sanguinaria canadensis*, is found throughout the temperate regions of the United States, east of the Mississippi River. It was used by the Indians as a dye for their garments, and for staining their faces and bodies, in which direction it served the double object of a coloring material, and to keep away insects, it being to them disagreeable. The Indians also used it as an acrid emetic, and, mixed with other herbs, in the form of an ointment, as an application to indolent ulcers, its action being somewhat escharotic. The early settlers

Digitized by Google

employed sanguinaria in these directions, while its efficacy in coughs and colds established it as a constituent of home-made compounds such as syrups and tinctures. To the Eclectic school of medicine is to be credited the professional use of this drug and its alkaloidal constituents, although its sensible qualities and domestic uses had been well established previous to the systematic efforts made by physicians of this section in medicine. Sanguinaria was mentioned by Barton (43), Cutler (178), Thacher (631), Schöpf (582), Bigelow (69), and other early investigators, whose recorded statements demonstrate the method of its introduction, as above described. In 1803, William Downey took this drug for the subject of the Thesis submitted by him to the University of Pennsylvania for his degree of Doctor of Medicine, dedicating his "*Experimental Inquiry*" to the celebrated investigator of American botanical products, Professor Benjamin Smith Barton, M. D., of the University of Pennsylvania. This publication was illustrated by an excellent frontispiece drawing of the plant, including flower, rhizome and immature fruit, no more characteristic being now in print. Dr. Downey made an analysis of the root according to methods then prevalent, deciding that "The principle of activity resides chiefly in the gum." His investigations were made before the discovery of alkaloids, and although he produced the *nitrate of sanguinarine*, he failed to purify it, merely stating that when nitric acid was added to the decoction of the root, "a precipitate instantly took place." Possibly there is no earlier description of the formation of an alkaloidal salt, surely not of an American drug.

Dr. Downey's physiological experiments, performed

Digitized by Google

on himself and friends, while not in accord with modern methods, are yet of great interest, especially as relating to the action of the drug when applied externally. Let us quote:

"A portion of the powdered root was sprinkled over the ulcers, and then covered with a little common cerate, in which some of the powder was also incorporated. The discharge, by this treatment, was much amended; the callous edges were rendered much softer, and the ulcers in general acquired a healthy appearance. It may be proper to observe, that these changes were effected by only a few applications of the powder."

As an internal agent, Downey sums up the problem as follows:

"We have seen that it is a powerful stimulant, and that when taken in certain doses, it excites vomiting. And that in small doses it acts as a general stimulating tonic, as is shown by its increasing the appetite, and its action on the arterial system.

"It has been placed in the class of emetics by Professor Barton, (see his *Collections for an Essay Towards a Materia Medica of the United States*), which is certainly its proper arrangement. Its most prominent effect being to induce vomiting even in moderate doses."

In connection with lard, arsenic and hydrated ferric oxide, sanguinaria constituted a once-popular "cancer" remedy. It was also a constituent of a very early Eclectic remedy, yet popular, "Compound Tar Plaster" (see Podophyllum). It is one of the most prolific bearers of alkaloidal content known to vegetation. Its red juice owes its color to a peculiar alkaloidal structure that, when pure, turns white by alkaline reaction, though the alkaloid itself is practically colorless.

Digitized by Google

SANTALUM RUBRUM (Red Saunders)

Official in every edition of the *U. S. P.* excepting the New York edition of 1830. In the editions of 1820 (and 2d ed. 1828) it was named in the Secondary List, but the Philadelphia edition of 1830 promoted it to Primary List.

Red sandalwood, red sanders, *Pterocarpus santalinus*, is a small tree native to the southern part of the Indian Peninsula, being found at Canara, Mysore and the Coromandel Coast. It is also found in the Southern Philippines. The wood is obtained chiefly from plantations in the forests of the Kurnool Hills and adjacent localities neighboring to Madras. The beginning of the use of this wood for temples and other primitive religious buildings is lost in antiquity. Marco Polo (518) refers to the fact that sandalwood was imported into China, distinguishing the variety by the word *red*. Garcia de Orta (480) of Goa, in the 16th century, distinguishes between the fragrant sandalwood of Timor and the inodorous red sandalwood. In this connection it should be remembered that santalum rubrum, or red sanders, has none of the qualities of the santalum album, or fragrant sandalwood. And yet it is recorded that all the languages of India call it by the name red-colored sandalwood. In the Middle Ages, sandalwood was used in Europe for coloring purposes, being quoted in England, 1326 and 1399, at three shillings per pound, and being entered on the accounts of the Monastery of Durham, 1530, along with spices and groceries. It is used in pharmacy as a coloring agent, after the manner in which it was employed in domestic economy in the olden times, for the same purpose. To fail to credit Dymock with his researches on this conspicuous Indian tree, would be a gross oversight. To attempt to improve on his descriptions, or to summarize them, would

Digitized by Google

be unsatisfactory. We therefore quote from him, as follows:

"Sanskrit writers mention two kinds of sandalwood, (Chandana): the darker, heartwood, they call *Pita-chandana*, or yellow Sandal; and the lighter wood, *Srikhanda*, or white Sandal. Chandana is mentioned in the *Nirukta*, or writings of Yaska, the oldest Vedic commentary extant, said to be written not later than the 5th century B. C. It is also referred to in the ancient epic poems of the Hindus, the Ramayana and Mahabharata.

"According to the Kathasaritsagara, it is one of the trees of the Buddhic paradise, and the chariot of the sun is made of its wood bound with gold.

"Under the name *gandh* (perfume), sandalwood paste is largely used in Hindu ceremonial, being smeared upon idols and upon the foreheads of their worshippers. The wood is chiefly consumed at the *chita* or funeral pile, even comparatively poor people spending as much as fifty rupees upon it.

"Sandalwood logs are about a yard in length and 5 to 6 inches in diameter; they are stripped of the bark, and a portion of the sapwood. Andreas Peterson of Copenhagen, who in 1886 made a very careful investigation of the wood, says: 'It is very homogeneous, rather hard and ponderous, although it does not sink in water. The heartwood is pale reddish, with darker reddish-brown and brighter yellowish concentric zones, which, examined under the microscope, prove to be annual rings. In the inner part of the wood they are sometimes very wide, measuring, for instance, as much as seven millimetres. Possibly, therefore, they do not

Digitized by Google

correspond to one year's growth, but to that of a longer period.'

"The transverse section, examined by means of a lens, displays the numerous narrow medullary rays; the vessels are partly empty, partly loaded with yellow resin. In the bright yellowish sapwood both vessels and medullary rays are less distinct. The sapwood is scentless, whereas the heartwood, especially when freshly cut, is in a high degree possessed of the very agreeable and remarkably persistent odor of sandal." (Dymock, *Pharmacographia Indica*, v. 3.)

SANTONICA (Wormseed)

First mentioned in the *U. S. P.* of 1860, it remained official until 1900. In the edition of 1910 the drug Santonica is replaced by its derivative, *Santoninum*, (*Santonin*). The official source of Santonica is the *Artemisia pauciflora*, *U. S. P.*, 1910.

The "wormseeds" are widely distributed in the northern hemisphere of the Old World, many varieties being familiar to botanists and subject to much discussion. The unopened flowers of the head (*wormseed*) are collected in quantities on the vast plains or steppes in the northern part of Turkestan, the distributing point being the renowned fair of Nishni Novgorod, Russia, where, July 15th to August 27th, the celebrated exchanges of products occur. Wormseed, however, is found in the Oriental bazaars, being brought for native and domestic use from the sections of country named, or from Afghanistan or Caboul. Dioscorides (194) mentions several species of wormseed, stating that the small seeds were mixed with honey and employed by the people as a remedy for ascarides. Alexander Tral-

Digitized by Google

lianus (11), in the 6th century, commended this drug as a remedy for intestinal worms. Saladinus, 1450, (570), and afterwards several authors of the 16th century, as Ruellius (561) and Dodonæus (195), refer to the remedy as a vermifuge for children. Its empirical use in domestic medicine is maintained to the present time, and from this source its anthelmintic virtues were learned by the profession.

SARSAPARILLA (Sarsaparilla)

Official in every edition of *U. S. P.*, from 1820 to 1910, which directs the root of *Smilax medica* (Mexican sarsaparilla), or *Smilax officinalis*, or an undetermined species of *Smilax* (Honduras sarsaparilla), or *Smilax ornata* (Jamaica sarsaparilla).

The drug sarsaparilla is furnished by the root of a climbing plant of the genus *Smilax*, which prevails over the northern part of South America, the whole of Central America, and the west coast of Mexico. Many varieties contribute the drug of commerce. Its qualities were made known in the early European annals from the commendation of explorers of the New World. Monardes (447) is authority for the statement that it was introduced to Seville about 1536 from "New Spain," but that a different variety soon followed from Honduras. The "*Chronicle of Peru*," by Pedro de Cieze de Leon (151) 1553, mentions sarsaparilla as growing in South America, where he observed it between 1533 and 1550. It was recommended as a cure for syphilis and acute rheumatism, the Spaniards calling it "an excellent medicine." The name then applied to it was *zarza parilla*, afterward becoming sarsaparilla. Like other remedies introduced in business channels for commercial purposes from the wonderful New

Digitized by Google

World, sarsaparilla enjoyed a marvelous reputation, which was evidently not interfered with by the fact that it returned great profit to the dealers. A small work issued by Girolamo Cardano (123), of Milan, 1559, advocates it most strongly in the direction of the diseases mentioned. Sarsaparilla found its way into pharmaceutical stores, where it made an eventful record as a new remedy from the New World. In domestic medicine, from the time of its introduction, a decoction has been "authoritatively" considered serviceable as a "blood purifier." It is not necessary to state that in the form of a sweetened decoction, syrup of sarsaparilla has, through several decades, enjoyed continual conspicuity in the *U. S. Pharmacopeia.*

SASSAFRAS (Sassafras)

Official in every edition of *U. S. P.* The early editions, 1820 and 1828, mention "the bark of the root." Beginning with 1830, (New York ed.), both the bark and the pith of the stem are official till 1900. The pith is dropped in 1910. The *U. S. P.*, 1910, directs the root bark of *Sassafras variifolium.*

Sassafras is indigenous to the Western Hemisphere, occurring in Florida, Virginia, and as far north as Canada. It is found as far west as Kansas, but is there very scarce. Its occurrence in Brazil is recorded by Piso, 1658, (511). Sassafras was in medicinal use among the natives of Florida long before Ponce de Leon in 1512 set foot on the soil of that peninsula. It is generally stated and believed that the Spaniards in 1538, which is the date of De Soto's invasion of Florida, were the first Europeans to obtain knowledge of the drug; yet we can find no record of such a discovery in at least two narratives of this expedition accessible to us. On the other hand, there seems to be sufficient evidence

Digitized by Google

of the fact that the Spaniards gained a knowledge of sassafras and its medicinal virtues through the French Huguenot emigrants, who under their unfortunate leaders, Jean Ribault and René Laudonnière, occupied Florida between the years 1562 and 1564.

To the Spanish physician, Nicolaus Monardes (447) of Sevilla, in 1574, is to be credited the first detailed description of sassafras and its healing virtues, his information being gained, however, not from actual experience in the sassafras lands, but from personal consultation with travelers and from the government records at his command. (239). From Clusius' (153) version of Monardes, 1593, it is learned that the drug was imported from Florida into Spain some years previous to 1574, that the Spaniards in Florida, when overtaken by fevers and other diseases consequent to miasma and unwholesome drinking water, were advised by the few remaining Frenchmen to use this drug, called by the French *sassafras*, (for reasons unknown to Monardes), and "pavame" by the Indians from whom the French obtained their information. Monardes (in Clusius' version) adds that sassafras grows in Florida in "maritime places," such as are neither too dry nor too moist. It is especially plentiful near the harbors of St. Helena and St. Matthews, forming whole woods, which exhale such a fragrance (not true in the experience of this writer), that the Spaniards who first landed believed the tree to be the same as the cinnamon tree of Ceylon.

The illustration of the sassafras tree given by Monardes has been widely copied in the herbals of the 16th and 17th centuries, among which we name Dalechamps (1586), (181), Joh. Bauhinus (Bauhin, 47)

Digitized by Google

(1650), and Piso (1658) (511), the latter giving it the Brazilian synonym "anhuiba."

Francisco Hernandez (314), another Spanish physician, who traveled through Mexico between 1571 and 1577, speaks of the occurrence of sassafras at Mechuacan in Mexico. His work was translated by Francisco Ximinez, a monk of the convent of San Domingo in Mexico, in 1615.

The latter author is quoted at length on the subject of sassafras by Jean de Laet (368), a noted Dutch geographer, whose work, "*Novus Orbis*, etc., 1633," testifies to the probably French origin of the knowledge of sassafras. Having taken the account given by Laudonnière as his source, he speaks, in Chapter XIV, concerning the land and inhabitants of the part of Florida traversed by the French, and calls attention to the tree as being prominent in the woods, and refers to the exquisite odor of its wood and bark. He says that this tree is called "*pavame*" by the Indians, and "*sassafras*" by the French.

Professor Flückiger remarks (*Pharmacognosie des Pflanzenreich*, 3d ed., Berlin, 1891), that he was unable to find the passage alluded to in Laudonnière's own report of 1586, and diligent search on our part in a verbatim reprint of this work of 1853 also failed to produce the passage. The term "*esquine*" occurring therein might have been the passage referred to, but it hardly stands for sassafras, for it is stated (pp. 6 and 76) that it is a twining vine, good against pocks (la vérole). On page 133 a root is mentioned from which Indians produce flour to make bread, and on page 155 it is stated that the colonists in a period of distress used the wood of this "*esquine*" to make flour and bread, which pre-

Digitized by Google

cludes sassafras from being the tree referred to. However, it is further stated (page 10) that in councils of war and peace the native king gathers around him the priests and the eldest of the tribe, and that they drink from the same vessel a decoction quite hot, called by them "*casiné*," made from the leaves of a certain tree. This might refer to sassafras, for the further statement is made that this potion has the effect of causing abundant sweats.

It must, in our opinion, with due deference to preceding authorities, be mere conjecture as to whether any of their descriptions answer to sassafras.

De Laet credits Ximenez with the statement that sassafras wood has the property of rendering sea water potable, as experienced by Ximenez on a voyage from Florida to Vera Cruz in 1605.

Soon after the discovery of sassafras the drug was exported to Europe, and became at once known in Spain and France. It was well known in Frankfort-on-the-Main as early as 1582, and in Hamburg in 1587, at which time it was termed *lignum pavanum seu floridum, seu xylomarathri* (fennel-wood) (Flückiger, *Am. Journ. Phar.*, 1876). Sailing expeditions to America were undertaken in those times to secure the wood as well as the root. An English merchant, Martin Pring, is recorded by Charles Pickering (510) as having with two small vessels arrived on the American coast in the beginning of June, 1603. The point named is 43 degrees long. and 44 degrees north lat., among a multitude of islands. Following the coast south in search of sassafras, he entered a large sound, and on the north side in the latitude 41 degrees and "odde" minutes built a hut and enclosed it with a barricade, where

Digitized by Google

some of the party kept guard, while others collected sassafras in the woods. The natives were treated with kindness, and the last of the two vessels departed, freighted, on the 9th of August.

In connection with the introduction of sassafras root, we present the following interesting record from the *Calendars of State Papers of the Public Record Office*, unearthed by Daniel Hanbury (*Proc. Am. Phar. Assoc.*, 1871, p. 491):

"Instructions for suche thinges as are to be sente from Virginia, 1610.

"(1). Small Sassafras Rootes to be drawn in the winter and dryed and none to be medled with in the somer and yt is worthe 50£ and better, p. Tonne."

And yet, the exact botanical origin of sassafras was unknown to the writers of the 17th century. While they were well acquainted with the peculiar foliage and the other characteristics of the tree, the flowers and fruit were expressly stated to be unknown to such writers as Clusius (153), Monardes (447), 1593, Joh. Bauhinus (47), 1650, and Piso (511), 1658.

Two early statements concerning the fruit may, however, now be recorded:

Caspar Bauhinus (48), who named the sassafras tree "arbor ex Florida ficulneo folio," in 1623, reports that specimens of the leaves and the fruit were sent to him by Dr. Doldius, of Nuremberg. He describes the fruit as oblong, rugose, and attached to very long pedicels.

Likewise, Jean de Laet (368), in the index to his chapter on sassafras, requests the reader to insert in the text that the fruits of this tree were brought to the notice of the author by a person returning from Novo

Digitized by Google

Belgio, and adds that the fruit does not differ much in form from the berries of the laurel, although it is much smaller. It contains a white nut of bitterish taste, divided into two parts.

As far as we can ascertain, Plukenet (514a), as late as 1691, was the first to give an illustration of the berry, which, however, is faulty, because it is void of the acorn-like calyx. The trilobed leaves are also illustrated, and the botanical name affixed to it by Plukenet is "cornus mas odorata, foliis trifido, margine plano, sassafras dicta."

Catesby (130), true to his task as set forth in the title of his book on the natural history of Virginia, etc., "to correct faulty illustrations of plants by preceding authors," gives, 1731, a good picture of sassafras, including the fruit and flowers.

In the middle and later part of the 18th and the earlier part of the 19th century, sassafras was studied in its native country by such celebrated travelers as Peter Kalm (350), J. David Schoepf (582), F. A. Michaux (433), and Fred. Pursh (528). Peter Kalm's account, especially, contains many points of interest.

Regarding the botanical nomenclature of sassafras, Linnæus in 1737 assigned it to the genus laurus, upon the examination of a specimen of the flower which proved to be clearly distinct from the genus cornus, to which Plukenet had assigned it. In 1758 he gave it the name *Laurus Sassafras*. The botanical name subsequently underwent the following changes:

"*Laurus variifolia*, Salisbury.

"*Sassafras officinale*, Nees v. Esenbeck and Endlicher, 1831.

"*Sassafras Sassafras*, Karsten, 1880–1882.

Digitized by Google

"*Sassafras variifolium* (Salisbury), O. Kuntze, adopted in the *U. S. Pharmacopeia*, 1890."

The boyhood of the author of this study of drugs was spent in the country (in Kentucky), where sassafras abounds. He records as follows:

"I do not remember to have smelled the fragrance of sassafras trees, mentioned by the early authorities, unless the trees were broken or bruised. I have at all seasons passed through thickets of trees, young and old, and am sure that the statement that the fragrance is wafted far out to sea is overdrawn, as I observed no odor whatever, and am satisfied that unbroken sassafras exhales no aroma. When land in Kentucky has been 'worked poor,' and turned out to rest, it is likely to spring up in thickets of sassafras, persimmon, and black locust. I have heard old farmers, in speaking of a farm, say it was 'too poor to raise sassafras,' and no greater reflection could be cast on that land. No special value is put on sassafras wood; it is not sought for fence posts, nor is it used to drive away insects of any description.

"As a remedy, the root bark of sassafras is used in the spring to 'thin the blood,' a decoction from this being drunk as a tea. Indeed, I do not dislike this 'tea' as a breakfast beverage, early impressions leading me now, occasionally, to procure fresh bark for a family brewing of 'sassafras tea,' made after the same manner in which tea is prepared as a beverage, and served in the same way, either clear, or with cream and sugar, according to taste. That sassafras tea was a very common beverage in my boyhood days, is shown by the following incident:—I was traveling up the Ohio River on one of the palatial steamers of other days, (1858).

Digitized by Google

A Kentuckian at my side ordered tea. The waiter asked 'What kind of tea?' 'Store tea,' he answered. 'I kin git plenty of sassafrac (*colloquial—L.*) at home!'"

It is not customary for sassafras drinkers to keep the root-bark separated from the root, the recently dug roots being shaved as the bark was used. Kentuckians claim that there are two varieties of sassafras, the red and the white, distinguished only by the bark. The white sassafras is not so aromatic and is bitter to the taste. In Kentucky, the red bark only is used.

In addition to the wood, root and bark, mucilage of the pith is employed in domestic medicine, for bathing inflamed eyes. A comprehensive description of the domestic uses of sassafras in Rafinesque's *Medical Flora*, 1830, is reproduced as a fitting ending to this record of sassafras:

"Found from Canada to Mexico and Brazil. Roots, bark, leaves, flowers, fragrant and spicy. Flavor and smell peculiar, similar to fennel, sweetish sub-acrid, residing in a volatile oil heavier than water. The *sassafrine*, a peculiar mucus unalterable by alcohol, found chiefly in the twigs and pith, thickens water, very mild and lubricating, very useful in ophthalmia, dysentery, gravel, catarrh, etc. Wood yellow, hard, durable, soon loses the smell, the roots chiefly exported for use as stimulant, antispasmodic, sudorific, and depurative; the oil now often substituted; both useful in rheumatism, cutaneous diseases, secondary syphilis, typhus fevers, etc. Once used in dropsy. The Indians use a strong decoction to purge and clean the body in the spring; we use instead the tea of the blossoms for a vernal purification of the blood. The powder of the leaves used to make glutinous gombos. Leaves and buds used to flavor some beers and

Digitized by Google

spirits. Also deemed vulnerary and resolvent chewed and applied, or menagogue and corroborant for women in tea; useful in scurvy, cachexy, flatulence, etc. Bowls and cups made of the wood; when fresh, it drives bugs and moths. The bark dyes wood of a fine orange color called *'shikih'* by Missouri tribes, and smoked like tobacco."

SCAMMONIUM (Scammony)

Official in all editions of the *U. S. P.*, from 1820 to 1910.

The dried juice of scammony (*Convolvulus Scammonia*) has been used in domestic medicine from ancient times. Theophrastus (633), 300 B. C., mentions it, as well as did Dioscorides (194), Pliny (514), Celsus (136), and Rufus of Ephesus (561a), a city in whose neighborhood scammony abounded, as is yet the case, near its ruins. The early Arabians were acquainted with scammony, and it was used in Britain in the 10th and 11th centuries, being commended to Alfred the Great by Helias, Patriarch of Jerusalem. Botanists of the 16th and 17th centuries, as Brunfels (107), Gesner (264), and others, described the plant, as well as the drug obtained therefrom, the latter being well described by Russell (566), an English physician of Aleppo, in 1752.

Scammony is obtained from Asia Minor near Smyrna, which is its principal port of export. The resin of scammony, in the form of a dried juice, was gathered by means of sea shells, within which the juice collected was dried, a method of obtaining it still practiced in Asia Minor. Mr. Clark, of Sochia, near Smyrna, obtained the resin as an alcoholic extract from the dried root, a method of production now in use, but which probably

Digitized by Google

yields a product different from the natural gum (see Manna). The writer of this study, when in Smyrna, 1906, obtained from Mr. Agop Alpiar, chemist of A. Keun & Company, opium merchants of that city, an authentic specimen of pure scammony. This is now in the hands of Dr. J. P. Snyder, of the American Drug Manufacturers' Association, Chairman of one of the research committees of that organization. Scammony is a gift of the Orient, the beginning of its use being in home medication.

SCILLA (Squill)

Official in all editions of *U. S. P.*, from 1820 to 1910.

This bulbous plant (*Urginea maritima*), is broadly distributed in the islands of the Mediterranean and the countries neighboring, in the south of Spain and Portugal, and in many instances is found far inland, even to an elevation as high as three thousand feet above sea level. It is one of the most anciently recorded remedies, being mentioned by Epimenides (294), a Greek writer of the 7th century B. C., who made such use of it that it became known as *epimenidea*. Theophrastus (633) mentions it, Pliny (514) notes its two varieties. Dioscorides (194) describes the making of vinegar of squills, whilst preparations of squill with honey were familiar remedies in Arabian medication. The forms employed by the empiricists of those remote times seem not to have been improved upon by the pharmacy of even the present day; indeed, pharmacal attempts to improve the aqueous or acetous squill simples of ancient home medication by alcoholic extracts and tinctures have, in the opinion of this writer, resulted in failure.

Digitized by Google

SCOPARIUS (Broom)

Introduced into the *U. S. P.* in 1840, but in this and the succeeding edition, (1850), it occupied a place in the Secondary List. It was transferred to the Primary List in 1860, and was official thereafter. Dropped from 1910 edition.

This woody shrub, *Cytisus Scoparius*, or common broom, prevails throughout Great Britain and western and temperate Northern Europe, but it seems not to climb to any great height on the mountains of the Alps. According to Ledebour (375) it is native to the eastern side of the Ural Mountains. Scoparius is mentioned in the earliest Italian and German herbals under the name *genista*, and under the name *broom* it was used in Anglo-Saxon medicine as well as in the Welsh "*Meddygon Myddfai*" (507). The *London Pharmacopeia*, 1618, gave a place to scoparius, and Gerarde (262) states that Henry VIII used it as a remedy "against surfets and diseases thereof arising." Broom also enjoyed a reputation in other directions, being the emblem of "The Handsome" Geoffrey, or "Plantagenet" Count of Anjou, ancestor of the Plantagenet kings of England, who wore the common broom of his country, the "planta genista," in his helmet. In the *Pharmacopeia of the United States*, scoparius seems, like other established foreign drugs, to have heired its reputation and obtained its position from past records in medieval European or Oriental times, and not from any marked use it has enjoyed in American medicine.

SCOPOLA (Scopola)

Scopola enjoyed but a brief season of pharmacopeial favor. It was introduced in the 1900 edition, along with its alkaloid, Scopolamine Hydrobromide. The latter was retained in the 1910 edition, but the drug itself was dropped.

The root of *Scopola carniolica* is now official, and in the making of the mydriatic alkaloids, it may be sub-

Digitized by Google

stituted for belladonna. Although of recent introduction in scientific pharmacy, it has an interesting botanical record, reaching back to Matthioli (414), who named it *Solanum somniferum alterum.*

This historical record of scopola is made complete by that unexcelled authority, E. M. Holmes, of London, whose paper is published in full in the *Pharmaceutical Journal and Transactions*, London, Dec. 14, 1889, pp. 468–471. The name by which it is now recognized was given to it by Jacquin (388a), in honor of Dr. Johann Anton Scopoli, professor of botany in the University of Pavia, who, in 1760, published his discovery of the plant under the name *Atropa caule herbaceo.* Many are the names since affixed to it, regarding which Mr. Holmes remarks as follows: "Jacquin's name has unfortunately been several times altered by succeeding botanists."

The historical treatise of Holmes was briefly condensed by Professor Maisch (401a), as follows:

"The Natural History of *Scopola carniolica* (Jacquin) gives a complete history of the synonyms of this plant, commencing with Matthioli, who in 1563 named it *Solanum somniferum alterum.* It was further described in 1622 by Caspar Bauhin under the name of *Solanum somniferum bacciferum;* in 1651 by J. Bauhin as *Solanum manicum*, 'quod secundo loco proponuimus;' in 1760 by J. A. Scopoli, Professor of Botany at Pavia, as *Atropa caule herbaceo foliis ovatis, integris, fructu capsulari;* in 1764 by Moench as *Scopola trichotoma;* in the same year by Schultes as *Scopolina atropoides;* in 1821 by Link as *Scopolia atropoides;* and in 1837 by G. Don as *Scopolia carniolica.*

"The generic name Scopolia had been applied in 1763 by Adanson for what is now *Ricotia, Lin., Cruciferæ;*

Digitized by Google

ROSA GALLICA, Page 272 (No. 1)

Upper. OLIVE ORCHARD, ON ROAD TO BRUSSA, NEAR MOUNT OLYMPUS

Lower. AGED OLIVE TREES (Near Mt. Olympus, Brussa, Turkey)

Photographed by Mrs. John Uri Lloyd.

Digitized by Google

Digitized by Google

in 1776 by Forster for what is now *Griselinia, Forst., Cornaceæ;* in 1781 by Linnæus fil., for what is now *Daphne, Lin., Thymelaceæ;* in 1790 by Smith for what is now *Toddalia, Juss., Rutaceæ.*

"Jacquin's name for the plant being the first binomial one published after the date of the first edition of Linnæus' *Species Plantarum* in 1753, should supersede the later names given by others. This author repeatedly writes *'Scopola'* (*not* Scopolia) in his published work."

This plant, scopola, possessing so much energy, was naturally known to the early herbalists, but was most cautiously employed by them. Wier, 1515–1588, mentioned it, (*Maisch*) (401a), but it was then forgotten until Dr. Lippich, of Padua, 1834–7, used it instead of belladonna. The record shows that in Southern Europe, (*Martius*, 1832), (410a) the leaves were used in the same way as belladonna. Kosteletzky, 1832, (361a), states that it has the narcotic qualities of hyoscyamus. Neither in domestic nor in professional medicine had scopola any reputation worth mentioning until after 1880, when its alkaloidal record and its many complications as a sophisticant for belladonna made such an event in pharmacy and chemistry as to give the plant a position in the *U. S. Pharmacopœia* of 1900.

SCUTELLARIA (Skullcap, Mad-dog Herb)

Introduced into the *U. S. P.* in 1860, but occupied a place in the Secondary List in this and the following edition, 1870. It was wholly official from 1880 to 1900, but was then dropped, not appearing in the 1910 edition.

Parts Used.—The leaves and twigs of *Scutellaria lateriflora.*

The record of this American drug is so remarkable,

Digitized by Google

for several reasons, as to lead this reviewer to accept that, in justice to the problem as a whole, unusual attention is needful in its direction. He therefore devotes to it more space than usual, and even then he appreciates that he but faintly presents the story of this drug.

Like some others, (Chionanthus for example), this plant was introduced for one purpose which was later lost to sight, other uses becoming conspicuous. Thus coca was introduced as a stimulant and considered as a substitute for tea and coffee; abandoned as inert by no less an authority than Dr. E. R. Squibb, an alkaloid of it, cocaine, was next found to possess most remarkable qualities as a local anesthetic.

Before the date of the publication of the first American Materia Medica, by Schoepf, in 1785, Dr. Lawrence Van Derveer, of Roysfield, New Jersey, to whom may be given the credit of its introduction, used scutellaria in his practice, believing it to be of exceeding value as a remedy for hydrophobia. Dr. Van Derveer has been charged with keeping his remedy a secret, but although he became celebrated as an expert in treating the disease, there is no evidence to show that he ever kept the name of the drug private. For forty years he had a widely extended neighborhood reputation as a specialist in hydrophobia, during which time he treated as many as four hundred persons (an average of ten a year), with but one death.

Nor need we look with suspicion upon the large number of cases of hydrophobia said to have been treated by Dr. Van Derveer. Statistics from the most reliable sources show that hydrophobia was either very common a century ago, or the scare over it widely disseminated. In our early life in Kentucky we continually heard of

Digitized by Google

deaths from this cause, and knew of frequent rabies in our neighborhood. The disease is one demanding immediate medication. No risk of time, remedy or physicians will be taken by any one, and it is likely that each person bitten by a questionable dog, and knowing Dr. Van Derveer's reputation for treating the disease, would make every effort to secure his personal services. The rule of seeking a therapeutic expert holds good today. In recent years (1908), two persons bitten by a mad dog in Florence, Kentucky, went at once to Chicago to receive authoritative "serum" treatment, both of whom, however, died of hydrophobia, as recorded by Dr. W. M. Corey, of that town, who accompanied these patients to Chicago, where they received the Pasteur treatment, with which the profession is familiar. Let us now revert to the literature connecting scutellaria with the dreaded disease, hydrophobia.

SCUTELLARIA IN HYDROPHOBIA.—In 1812, Dr. James Thacher (631), who served as surgeon through the Revolutionary War, locating then in Plymouth, Massachusetts, issued a book of 301 pages titled:

"Observations on Hydrophobia, produced by the bite of a mad dog or other rabid animal, with an examination of the various theories and methods of cure existing at the present day, and an inquiry into the merit of Specific Remedies. Also a Method of Treatment best adapted to the Brute Creation."

In this book, whose frontispiece carried the illustration of *Scutellaria lateriflora*, Dr. Thacher considers in detail the history and pathology of hydrophobia, as well as the various theories that have prevailed concerning its origin and distribution, together with discussions from such eminent authorities as Boerhaave, Hunter,

Digitized by Google

Darwin, Rush, Cullen, Physick, Coxe, etc. These were analytical and discursive, involving the cause, progress and treatment of the disease. But though very interesting, they are not here relevant.

Chapters XIII and XIV of Thacher's book deal with the many nostrum cures for hydrophobia that have been celebrated both popularly and in the medical profession, such as "the liver of the mad dog broiled," "cray fish burnt with twigs of bryony," the famous "East India Remedy," "Sir George Cobb's powder," the famed "Pulvis Antilyssus" of Dr. Mead, the renowned "Omskirk medicine," and a host of such that had their day and passed into disrepute. Among these was "Crouse's Remedy," once so celebrated as to have induced the New York Legislature, 1806, to purchase the formula, for which it paid one thousand dollars. It was found to be as follows:

"Jawbone of a dog, bruised and powdered, one ounce; false tongue of a newly-foaled colt, dried and powdered, one ounce; verdigris on an old copper coin (coinage of George I or II preferred), one scruple. Mix the ingredients and give a teaspoonful at a dose."

Seventeen pages of Thacher's book are devoted to the record of scutellaria, in which the names of Dr. Van Derveer, "a physician of eminence in New Jersey," and the "Lewis's" use of scutellaria play an important part. Out of a large number of cases but one failure was reported, that of a Dr. Bartlett, who began the use of the drug eight or ten days after several animals were bitten, six of which died of hydrophobia. This lapse of time led Dr. Thacher to say:

"The facts offered by Dr. Bartlett, although deserving of serious consideration, are not to be accounted sufficient

Digitized by Google

to countervail the copious mass of evidence from unquestionable sources, which has been exhibited."

In summing up, Dr. Thacher, who had condemned all the so-called "cures," and all other remedies named, writes of scutellaria:

"Since the plant is not known to possess properties inimical to the constitution, it merits the most persevering examination and trial in every instance, in either the human subject or brute creation. Every consideration therefore conspires to urge the employment of this article, and the result of every experiment ought to be promptly promulgated."

From the date of Thacher's publication (1812) to the present time, 1920, scutellaria has not commanded much attention either in the press or from the medical profession of the Eastern states. Except to the casual student, the remarkable record of the drug has been completely lost.

In tracing the history of scutellaria, we find that Lyman Spalding, M. D., in 1819, read a lengthy and detailed paper before the New York Historical Society on the "History and Use of Scutellaria Lateriflora in Hydrophobia." This was soon afterward published in pamphlet form of thirty pages, carrying as its frontispiece the illustration of Dr. Thacher. Its title page was:

"A History of the Introduction and Use of Scutellaria Lateriflora (Scullcap), as a Remedy for Preventing and Curing Hydrophobia, Occasioned by the Bite of Rabid Animals; with Cases; accompanied with a plate of the plant, by Lyman Spalding, M. D. Read before the New York Historical Society, September 14, 1819, New York. Printed by William Treadwell, and for sale

Digitized by Google

by Collins & Co., No. 189 Pearl Street, and J. B. Jansen, No. 15 Chatham Street. 1819."

After giving Dr. Van Derveer credit for being "The first person, so far as we have been able to learn, who used Scutellaria as a preventive of hydrophobia from the bite of rabid animals," Dr. Spalding disposes of the charges of any secrecy as concerns the drug by Dr. Van Derveer:

"On a reference to the many nostrums which have been celebrated for preventing hydrophobia, we do not find that Scutellaria had been used either in Virginia, or in any other place, previous to its employment by the doctor. Our inquiries do not lead us to believe that he kept his remedy a profound secret, although he has been accused of so doing by many; but so much the medical men despise what they consider vulgar specifics, and so little faith do the public place in them, that this remedy for forty years was scarcely known or heard of beyond the doctor's immediate circle of practice. It was from these circumstances that no one had the curiosity to ask this gentleman how he came by a knowledge of the antidotal powers of Scutellaria. From the upright, unassuming character of Dr. Van Derveer, his correct moral deportment, and regular medical standing, we are led to believe that he would as frankly have communicated the source of his information, as the remedies used.

"Among the many persons to whom he communicated a knowledge of his remedies may be numbered Drs. Morris, Kinney, Little, Henry, and Bloomfield of the Revolutionary Army; Dr. Henry Schenck, Sen. Daniel Lewis, and Dr. Henry Van Derveer."

This, in our opinion, together with the evidence

Digitized by Google

given by Mr. Daniel Lewis, to whom he taught the use of the drug, and by his son, Dr. Henry Van Derveer, fully relieves Dr. Van Derveer from the charge of drug secrecy.

Next comes the statement that Dr. Van Derveer treated over four hundred persons, but two dying. For one of these Dr. Van Derveer disclaimed responsibility:

"Dr. Van Derveer was called to visit a young woman living near Rahway in New Jersey, who had been attended by another physician, and in whom hydrophobic symptoms had so far advanced before Dr. Van Derveer saw her, as in his opinion to preclude all human aid. She took the Scutellaria, but it did not cure the disease. She died rabid. The doctor was of opinion that several persons for whom he prescribed his remedy in the early part of his practice had some of the symptoms of hydrophobia, and that they were removed by a free use of the plant."

That Thacher accepted the estimate of Dr. Van Derveer, is shown by the fact that in his *Dispensatory* he states that out of four hundred treated, but one died.

Comes now the ever suggestive question, whether the scutellaria effected the cure, or whether the animals and people treated would have recovered without it. This problem is disposed of somewhat after the physiological methods of today to determine a drug's curative value, excepting that, instead of injecting animals in health to obtain a standard in disease expression, Dr. Van Derveer's process was to medicate afflicted creatures, and contrast them with the results noted in a similar number of animals not medicated.

For example: The physiological prover of today inoculates an animal in health with a given remedy, to de-

Digitized by Google

termine the potency of that drug with a human being afflicted by disease. Dr. Van Derveer antidoted (treated) animals inoculated with hydrophobia poison, to determine whether the remedy could cure the afflicted animals, or could abort or counteract (neutralize) the virus, providing it had not begun its action. He reasoned that if a substance (mad dog virus) killed a number of animals inoculated with it, either by the bite of a rabid animal or by injection, the virus was a poison. If a number of bitten animals were not medicated and died, whilst others inoculated in the same way, at the same time, and then treated with scutellaria recovered, he argued that the drug antidoted the poison. Let us quote from Dr. Spalding:

"Dr. Van Derveer made more than an hundred experiments on the antidotal powers of the scullcap, in each of which the remedy was given to a part of the bitten animals, none of which were afflicted with hydrophobia; but in every instance some of the animals which did not take the scullcap died rabid."

Concerning the number treated, we have the statement of Dr. Henry Van Derveer, son of Dr. Lawrence Van Derveer, in a letter to Dr. Spalding. He says:

"It is impossible to determine to what number of animals my father gave the scullcap. I should, however, say that it was not less than one thousand, and in no instance has an animal to which he gave the plant died of hydrophobia. In more than an hundred cases my father experimented with the Scutellaria, and he has repeatedly told his medical brethren that each experiment was successful, and tended to establish the antidotal powers of the plant."

Digitized by Google

Having now established the essentials concerning the introduction of scutellaria, let us briefly give a few abstracts illustrating the manner in which evidence was established a century ago, to demonstrate the drug's antidotal power. In all cases, the most detailed information, such as dates, localities, authorities, publications, etc., were recorded, as well as the testimony of witnesses under oath.

By Dr. Henry Schenck, Shannock Hills, New Jersey.—"In the year 1777, two black persons and five hogs belonging to Mr. James Van Derveer, of that county, were bitten by a mad dog. Dr. Van Derveer prescribed the Scutellaria, which was administered by our informant to the two blacks and to four of the hogs, neither of which had any symptoms of hydrophobia; but the fifth hog, which was the least injured, and which did not take the plant, died in a rabid state about the 19th day after the accident. This experiment, made for the express purpose of testing the antidotal powers of the scullcap, was witnessed by Drs. Morris, Kinney, Little, Henry, and Bloomfield, who considered it as having been satisfactorily conducted."

By Dr. Henry Van Derveer and Dr. John Vancleve, of Princeton, New Jersey: "About the year 1814, seven cattle belonging to George Schenk, Redington, Hunterdon County, New Jersey, were bitten by a mad dog. The scullcap was given to six of them, neither of which had any indisposition, but the seventh, which did not take the plant, died of hydrophobia three or four weeks after it was bitten.

"Of seven cattle bitten by a mad dog, in six treated no indication of hydrophobia appeared. The one not treated died of rabies."

Digitized by Google

Dr. Henry Van Derveer, who succeeded his father, reports:

"Seven persons were bitten by a puppy that showed indications of hydrophobia. Six were put in charge of a physician, treated with Scutellaria, and recovered. The seventh did not take treatment, and died fourteen days afterward of hydrophobia.

"Three persons in one family, and two cows were bitten. Two persons came at once to Dr. Van Derveer, took Scutellaria treatment immediately, and recovered. The third went to another physician, in seventeen days was stricken with symptons of hydrophobia, and sent for Dr. Van Derveer, who at once administered 'a very strong infusion of Scutellaria, which the patient drank in as large quantities as his stomach would retain. In thirty-six hours all symptoms vanished.' Both the cows died.

"A man, two hogs, and two cattle, were bitten by a mad dog. Scutellaria was given the man and one hog. Both recovered. The other animals died of hydrophobia.

"A negro girl, four hogs and a cow were bitten. Scutellaria was given the girl and one hog. Both recovered. The other animals died of hydrophobia."

By Mr. Lewis, North Castle, New York, (who obtained the remedy from Dr. Lawrence Van Derveer): "A number of hogs that had been bitten by a mad dog were divided into two groups. To one group Scutellaria was administered. All recovered. The others all died."

Another report is as follows: "Stephen W. Williams, M. D., and his father, both of Deerfield, Mass., have prescribed the Scutellaria for about thirty persons, and for forty or fifty brutes which had been bitten, and in

Digitized by Google

no instance did hydrophobia appear. In the doctor's letter to me of the 13th of August, 1819, he says: 'A Mr. Williams, of Heath, in this county, had, in the autumn of 1813, a valuable cow and an ox bitten at the same time by a mad fox. He applied to us for the Scutellaria. We had only enough for one animal. He prized his cow more highly than his ox, and was very anxious to save her. He therefore gave the whole of the scullcap to his cow, and suffered the ox to take his chance without any medicament. The ox died, exhibiting the aggravated symptoms of hydrophobia, while the cow had no indisposition.' "

Statements by recognized authorities, in the press and in magazines, finally became so abundant in support of scutellaria in hydrophobia as, if the disease was authentic, to seem incontrovertible. Two detailed reports given by Thacher, by Dr. Fisk, of Massachusetts, and by Dr. Robson, of New York, are too detailed for even summarizing.

FAILURES.—As recorded by Spalding, but one man reports a failure with the scutellaria antidote. He says:

"A child bitten was faithfully dosed with the infusion twice daily, but died on the 30th day." (*New York Medical Repository*, New Series, Vol. 1, p. 175).

Reported by Lewis Bartlett to Dr. Thacher, (*Thacher on Hydrophobia*, 1812), "Nine hogs were bitten by a mad dog, treated with Scutellaria, six died."

These are the only cases of failure reported by Dr. Spalding, out of more than 850 persons, and a large number of animals, treated with scutellaria. Dr. Spalding sums up the whole subject as follows:

"We have then the foregoing testimony that the Scutellaria has been used by more than eight hundred

Digitized by Google

and fifty persons, bitten by animals believed to be rabid; and in only three instances have symptoms supposed to be hydrophobic supervened, and in each of these cases the quantity of the plant actually taken was very inconsiderable. In two of them the symptoms disappeared on taking more freely of the medicine.

"Furthermore, the Scutellaria is said to have been administered to more than eleven hundred brutes, bitten by animals supposed to be rabid, and in no instance have any symptoms of madness appeared, excepting in the cases communicated by Dr. Bartlett.

"In more than one hundred instances it is said that experiments have been made to test the antidotal powers of this plant, by giving it to a part, only, of the animals bitten, and it is stated that in every experiment, those animals which did not take the Scutellaria have died rabid; but in no instance have any of those which took it had any indisposition."

SCUTELLARIA AS A SECRET REMEDY.—Now came the popular, newspaper era of the drug. In the year 1783 Mr. Daniel Lewis, of North Castle, New York, a weaver, was bitten by a mad dog. He went to New York for treatment, and was directed to Dr. Van Derveer of New Jersey. Dr. Van Derveer showed Mr. Lewis the plant, and by giving him written directions, taught him how to use it. Mr. Lewis recovered, and having the formula, next told his neighbors that he could cure hydrophobia, and began neighborhood treatment, acquiring thus a local reputation. He kept the name of the plant secret, using it only in form of powder, and acquainting only his son with the formula. At his death, 1810, he had treated successfully about one hundred persons. A record of these cases is given by

Digitized by Google

Dr. Spalding, accompanied by names, dates, places of residence, and often by certificates from witnesses. But in it all, seemingly, no mention was made of the treatment being identical with that of Dr. Van Derveer, from whom it was obtained, and who, as is recorded, did not make any secret of the name of the herb, giving it freely to whoever asked for it.

Before the death of Lewis the elder, the "Lewis Secret Cure" for hydrophobia became celebrated far and near, and it also became known to some persons that the remedy employed was identical with that of Dr. Van Derveer.

Scutellaria, about 1809, came into popular as well as newspaper notoriety as a cure for hydrophobia, one of the first notices in print being a letter to Mr. Robert Bowne, a celebrated philanthropist of New York City, published in the *Salem Gazette*, Sept. 15, 1809. The writer credits the Lewises with the secret cure, and states that the drug has been proven to be scutellaria, the identification being made as follows:

"The remedy he made use of is nothing more than a plant that grows in the fresh meadows of our country. The botanic name of it is Scutellaria galericulata.[1] This plant Lewis used to gather, dry it and reduce it to a powder, in order to prevent a discovery of what it actually was. It was found out by a person who obtained some of it in a powdered state; observing seeds in it, he placed them in his garden, where they came to perfection."

Following this, Mr. Coleman, editor of the New York *Evening Post*, published corroborative editorial testimony:

[1] An error. The plant is S. lateriflora.

Digitized by Google

"He himself had been witness of the cure of hydrophobia by the use of this plant alone, and that there are a number of gentlemen of the most respectable characters in New York, who will attest that they have been witnesses of repeated cures by the same remedy. He also confirms the account given in the above letter. The Rev. Dr. Cutler (Manasseh Cutler) also has received verbal information, which he considers as confirmatory of the above important particulars." *Thacher.*

Reference is made to these facts in Thacher's *New Dispensatory*, 1810, long descriptions being given in detail. In the revised edition, 1821, Dr. Thacher, after making his special study of the disease, condenses the article, abandons the verbatim reproduction from the current press, but emphasizes the value of scutellaria in the treatment of hydrophobia, in the following positive language:

"The medical properties ascribed to scullcap are those of an antidote against the effect of *canine madness.* In a publication entitled *Observations on Hydrophobia,* by the compiler of this work, a mass of evidence in favor of the antidotal powers of this plant has been recorded. Numerous gazettes and journals have also teemed with encomiums on its preventive powers, and from sources so respectable as to claim attention and confidence; and where it has been most known and employed, it has been the most highly extolled. Dr. Van Derveer, late of New Jersey, being in possession of the secret, acquired extensive popularity by his success; and he is said to have declared, that during his practice he has prevented upwards of three hundred persons from going mad, and that he never lost but one patient to whom his medicine had been administered. *From the*

Digitized by Google

high reputation, therefore, of Scullcap, perhaps surpassing that of any other remedy, practitioners ought to resort to the use of it on any occasion which may offer, either in relieving mankind from this awful malady, or in arresting the devastation among the brute creation."

TREATMENT.—The following is the manner in which Mr. Lewis and Dr. Van Derveer respectively prepared and administered the remedy:

"The leaves of Scutellaria should be gathered when in flower, carefully dried, reduced to a fine powder, and put into bottles, well corked, for use. When a person has received a bite by a mad dog, he must take of a strong infusion of the leaves or powder, a gill four or five times a day, every other day. The day it is omitted he must take a spoonful of the flowers of sulphur in molasses, in the morning, fasting, and at bedtime in new milk, and apply the pounded green herb to the wound every two hours, continuing the prescription for three weeks. For cattle or horses, use four times that prescribed for a man.—*Thacher.*"

THE DISCREDITING OF SCUTELLARIA.—Between the date of the discovery of the properties of scutellaria in 1773, by Dr. Van Derveer, who experienced nearly half a century of quiet, neighborhood practice of medicine, and the charlatanism methods of the weaver, Lewis, who knew nothing of medicine, but was an advertising *"mad-dog doctor,"* scutellaria passed into offensive notoriety, several causes uniting to discredit the drug.

1. The hostility of the leaders of the medical profession, largely by reason of its newspaper popularity, through which the drug had come to be dominated by non-medical men.

Digitized by Google

2. The extravagant claims of enthusiastic empiricists.

Thus, under prevailing therapeutic methods and theories, distrust of the remedy was natural, and antagonism to it became inevitable. The leaders of the profession of the date following 1820, neglecting Thacher's advice, either ignored scutellaria as a "quack" remedy for hydrophobia, or discredited it because of its mild inoffensiveness. Whether, in the ultimate, this ostracism of the remedy was just or unjust, in the face of all the evidence, rests yet unsettled. In the light of its record and of what history teaches concerning medical politics in the first half of the 19th century, it may be considered an open question whether scutellaria is an invaluable remedy that dropped from sight because of the prejudice of the men ("skeptics," they were called by Rafinesque), who opposed the methods of its advocates and refused to test the drug, or was dropped because it has no virtues. The talented scientist, C. S. R. Rafinesque, giving a summary of its hydrophobia record, in 1830, expresses himself much as the evidence appeals to us:

"Many empirics and some enlightened physicians have employed Scutellaria successfully. But several skeptical physicians have since denied altogether these facts, and pronounced the plant totally inert, *because it has no strong action on the system*, and has failed in their hands. Dr. W. P. C. Barton and Dr. Tully have strenuously asserted this, but without analyzing the plant, and *denying instead of proving*. . . . In hydrophobia it appears to be a good prophylactic, if not a certain cure. A physician (Dr. White, of Fishkill), bitten by a mad dog, has assured me that he alone

Digitized by Google

avoided the disease by using the plant, while others bitten by the same dog, died. Many instances of the same kind are on record: nay, many who believe in the property, say it never fails. We lack, however, a series of scientific and conclusive experiments, made by well-informed men; *they have been discouraged by the ridiculous denial of skeptics;* but let us hope these may yet be performed."—Rafinesque, *Mat. Med., Vol. II, 1830.* (Italics our own).

It will be observed that the scholarly Rafinesque, who was familiar with all connected scientific literature to his date, and who refers to such authorities as Tully and Barton, with whom he was intimately acquainted, asserts that the drug had not been given justice, because, to put the matter plainly in his words, the "*skeptics*" forbade. Nor do we find authoritative data between 1830 and 1920 to weaken this statement.

SENEGA (Senega or Seneca Snakeroot)

Official in every edition of *U. S. P.*, from 1820 to 1910.

Senega, the root of a small North American plant, *Polygala Senega,* enjoyed very early a reputation as one of the new remedies produced by America. The Seneca Indians of New York state employed it as a remedy for the bite of the rattlesnake, which led to its notoriety in the hands of Tennent, a Scotch physician in Virginia, who also administered it for coughs. Under the name senega, or rattlesnake root, it came to the attention of Dr. Mead, of London, and through his efforts and those of others, (even Linnæus writing a dissertation on it), senega root came into great demand. In domestic American medicine it has been continually used as an expectorant, the usual form being that of a

Digitized by Google

syrup. Until a few decades ago, senega came from the eastern United States and the central hill lands, as a small, wire-like root. Unexpectedly, a large, knotty variety was discovered in Wisconsin, which displaced the older variety. The problem was discussed by Professor Maisch and this writer in the *Am. Journ. of Pharm.*, (1889), and the *Proceedings of the American Pharmaceutical Association*, which see, (1889, p. 473 and 1891, p. 43).

SENNA (Senna)

Official in every edition of the *U. S. P.*, from 1820 to 1910. Senna of the *U. S. P.*, 1910, is the leaflet of *Cassia acutifolia* (Alexandria Senna of commerce), or of *Cassia angustifolia* (India Senna).

Senna leaves are from two species of *Cassia*, one native to Nubia and other sections of Africa, while the other abounds in Yemen and Southern Arabia, as well as in some parts of India, where it is cultivated for medicinal use. The cultivated plant, originally the product of Arabian seed, furnishes the leaves known in commerce as *Tinnevelly senna*. The drug was introduced into western Europe by the Arabians, in which connection it may be noted that, notwithstanding its present abundance in some parts of Africa, according to Isaac Judæus (336a), a native of Egypt, who lived about 850–900 A. D., senna was brought to Egypt from Mecca. In early Arabian medicine, the pods of the senna were preferred to the leaves. Its price in France, (1542), was about that of pepper or ginger. This writer found senna abundant in the Orient, carried in shops where food and provisions were sold, and in the bazaars of Aden, Arabia, as well as in those of Smyrna and Constantinople, it being everywhere a

Digitized by Google

familiar domestic cathartic. Its native use introduced the drug to medicine, and antedates historical record.

SERPENTARIA (Serpentaria, Virginia Snakeroot)

Official in every edition of the *U. S. P.*, from 1820 to 1910. The *U. S. P.*, 1910, directs the use of the rhizome and roots of *Aristolochia Serpentaria* (Virginia Snakeroot of commerce), or of *Aristolochia reticulata* (Texas Snakeroot).

Aristolochia Serpentaria is a perennial herb found in woodlands of the temperate parts of the United States, especially in the Allegheny and Cumberland Mountains, though it seldom prevails abundantly. It is by some believed to have been first mentioned in 1636 by Thomas Johnson, an apothecary of London, who issued an edition of Gerarde's (262) *Herbal*, which it is commonly believed was its introduction to England. Others, however, question whether the "snakeweed" mentioned in this work was not a species of *Aristolochia* from Crete. The early use of serpentaria in America was as a remedy for snakebite, which gave it the name *Virginia Snakeroot*, but in this direction it has not, to our knowledge, been used in recent times anywhere in America. The domestic use of serpentaria has been in the direction of a stimulant to the organs of digestion, and in the form of a tincture as a stomachic, it being one of the ingredients of the old-time popular "stomach bitters" of American home medication.

SINAPIS ALBA (White Mustard)

Not mentioned in *U. S. P.* of 1820 or 1828. Official in all other editions, including 1910.

White mustard, *Sinapis alba*, seems to be indigenous to the southern countries of Europe and western Asia, from which, according to Chinese authors, it was introduced into China. Formerly it was not distinguished

Digitized by Google

from black mustard. Its cultivation in England is quite recent, but it is now an abundant weed in many sections. White mustard, in common with black mustard, is an exceedingly popular, stimulating condiment. It is preferred, on account of its color as well as its mildness, to the black mustard. The "mustard seed" of the Bible (Matt. XIII: 32) is the product of a tree, *Salvadora persica*, and is not the same as the plant now known under the name mustard. (See J. H. Balfour, *Plants of the Bible.*) (35)

SINAPIS NIGRA (Black Mustard)

Mustard is mentioned in every edition of the *U. S. P.* The edition of 1820, (2d ed. 1828), mentions *Sinapis nigra* only. All later editions include *Sinapis alba*, as well as *S. nigra*.

Black mustard, *Sinapis nigra*, is an herb found over the whole of Europe, excepting the extreme north. It also abounds in northern Africa, Asia Minor, the Caucasian region, western India, southern Siberia and China, as well as in North and South America, where it is now naturalized. It was known by the ancients, Theophrastus (633), Pliny (514) and others noticing the plant. In early times it seems to have been used more as a medicine than as a condiment; but Diocletian, 300 B. C., speaks of it as a substance used as a condiment in the eastern part of the Roman Empire. During the Middle Ages, Europeans esteemed it as an accompaniment to salted meats. The Welsh "*Meddygon Myddfai*," (507 and Note to *Aconite*), of the 13th century, commends the "Virtues of Mustard." Household recipes of the 13th and 14th centuries constantly mention mustard under the name *senapium*. The convent lands of France produced it as a part of their revenues, 800 A. D. Black mustard is naturally of great impor-

Digitized by Google

tance, the credit of its introduction being, as with other substances of a like nature, due to the observing "empiricists."

SPIGELIA (Pinkroot)

Official in every edition of the *U. S. P.*, from 1820 to 1910.

Spigelia marilandica is an American plant, indigenous to the temperate regions and thick woods of this country. The Indians employed a decoction of the root as a vermifuge, thus introducing it at an early date to the settlers, the physicians and the botanists. It was described by Barton (43), Schöpf (582) and other authorities, but was never extensively used by the American schools of medicine, either the Botanic or the Eclectic. As a domestic remedy it was customary, half a century ago, to use a mixture of "pink root" and senna, to which were added a few pieces of manna, a homemade decoction being given to children and others afflicted with worms. In our opinion this home treatment formerly consumed most of the drug of commerce, which, since the discovery of santonine, has come to be of minor importance. In the days of this writer's experience as a prescription clerk in Cincinnati, 1865-1880, the mixture above described was in continual domestic demand, the decoction being prepared at home.

STAPHISAGRIA (Stavesacre)

Introduced in edition of 1880. Official in all later editions.

Delphinium Staphisagria, a native of waste places of Italy, the islands of Greece and Asia Minor, is now generally distributed throughout the Mediterranean countries and the adjacent islands, e. g., The Canaries. It was known to the ancients, being mentioned by Nicander (581), Dioscorides (194), Pliny (514) and others,

Digitized by Google

Pliny stating that the powdered seeds were used for destroying vermin of the head and body, in which direction it is still popular. Throughout the Middle Ages staphisagria continued in use, according to Pietro Crescenzio (172), of the 13th century. The seeds were collected in Italy, where the plant is still cultivated, and is in demand in domestic medicine as an insecticide. Staphisagria is a remedy highly valued by the Eclectics and by the Homeopathists, its use among the latter physicians antedating that with the Eclectics. Dr. Scudder (590), in the first edition of his *Specific Medication*, (1871), writes of it as follows:

"Staphisagria has a specific action upon the reproductive organs of both male and female; but more marked in the first. It quiets irritation of the testes, and strengthens their function; it lessens irritation of the prostate and vesiculæ; arrests prostatorrhea, and cures inflammation of these parts. It also exerts a marked influence upon the urethra, quieting irritation and checking mucous, or mucopurulent discharges; it influences the bladder and kidneys, but in less degree.

"The action of Staphisagria upon the nervous system is peculiar. It exerts a favorable influence where there is depression of spirits and despondence, in cases of hypochondriasis and hysteria, especially when attended with moroseness and violent outbursts of passion."

STILLINGIA (Queen's Root)

Introduced by the New York edition of 1830 (Secondary List), retaining this position in the 1840 edition. It was then transferred to the Primary List, and remained wholly official through all later editions.

Stillingia sylvatica is native to the pine barrens and other sections of the Southern States of North America.

Digitized by Google

In the form of an infusion or decoction it was long used in domestic medicine as a purgative and alterative, creeping thence to the attention of physicians of the Southern States. It was also employed empirically in cutaneous diseases, and as a constituent of various "blood purifiers," was commonly used by the people of the South. A once popular remedy, *Wayne's Panacea*, was asserted by Rafinesque (535) to depend for its qualities upon stillingia, which Dr. John King, (356, 357) in his *American Dispensatory*, most positively controverted. Inasmuch as Peter Smith (605), the "Indian Herb Doctor," neglects stillingia in his *Dispensatory*, while Rafinesque (535) gives it brief mention in his *Medical Equivalents*, it is evident that the drug came to the general attention of the medical profession by reason of its use by the settlers, about the date of the first edition of King's *American Dispensatory*, 1852. Since that period until the early 60's, it was a conspicuous constituent of the popular American "blood purifiers," and in the form of compound syrup of stillingia was used alike in empirical medication and by the profession.

STRAMONIUM

(Stramonium, Jamestown Weed, Jimson Weed)

Official, in whole or in part, in every edition of the *U. S. P.*, from 1820 to 1910. The early editions, 1820, 1828 and 1830, (both New York and Philadelphia), mention both *leaves* and *seed*. The editions of 1840 and 1850 make the root also official, but from 1860 the root is unmentioned. The editions of 1900 and 1910 confine their recognition to the *leaves* of stramonium. *U. S. P.*, 1910, permits leaves of *Datura Stramonium* or of *Datura Tatula*.

Datura Stramonium is now found throughout most parts of the temperate civilized world. It was early noticed in America, where the settlers near Jamestown,

Digitized by Google

Virginia, in their search for "pot herbs," used it with fatal results, thus advertising it so as to create and establish for it the common name, still in use, "*Jimson weed*," (*Jamestown weed*). De Candolle (186) decided that stramonium was indigenous to the Old World, probably bordering the Caspian Sea, but that it was not found in India nor yet in Europe at the time of the classical period. Dymock does not mention the plant as a native of India.

Stramonium has been valued as a pain-relieving favorite in domestic American medicine, in the form of a poultice or ointment made from the pulp of the bruised green leaves, to ease the pains of bites and stings of insects. In this manner it was employed in Kentucky in the writer's boyhood days, (1855–60), "we boys" pounding the green "Jimson" leaves to a pulp and applying them as a panacea to bee stings, bruises and venomous bites. The dried leaf of stramonium has long been smoked for the relief of asthma. The domestic use of stramonium in these directions led the early American physician to its employment, both internally and externally. (See *Hyoscyamus*). At the present time, 1921, this long despised weed (stramonium) supplies *Atropine* for the American market, the firm of Eli Lilly & Company, Indianapolis, using enormous amounts of the green plant for that purpose. The alkaloidal content of stramonium (now known) corroborates the validity of the empirical uses of stramonium, as announced at an early date. It has been the subject of considerable research, that of Dr. Alfred R. L. Dohme (1893–4) being designed to differentiate the yields from different parts of the plant at different seasons, a feature of his conclusions (*Proc. Amer.*

Digitized by Google

Pharm. Assn., 1894, contribution from the research laboratory of Sharp and Dohme), being to the effect:

"1st. That the stems of *Datura Stramonium* contain more alkaloid than the leaves.

"2nd. That the plant *Datura Stramonium* gathered in June contains less alkaloid than that gathered in July and August."

Let us now quote from King's *American Dispensatory*, 1852, concerning the qualities of the plant:

"PROPERTIES AND USES.—In large doses, a narcotic poison. In medicinal doses, it acts as an anodyne-antispasmodic, and without producing constipation. Used for allaying rheumatic, syphilitic, and neuralgic pains, also in mania and epilepsy.

"Externally, a poultice of the fresh leaves, bruised, or the dried leaves in hot water, will be found an excellent application over the bowels in severe forms of gastritis, enteritis, peritonitis, etc. (I have in many instances applied them to the perineum, in cases of retention of urine from enlarged prostate, where it was impossible to introduce a catheter, and after remaining on about half an hour have readily been able to pass the catheter, and thus relieved the patient. I have met with similar good results in urethral stricture.—*K.*) It will also be found beneficial as a local medication to all species of painful ulcers, acute ophthalmia, swelled breasts, inflammatory rheumatism, and hemorrhoidal tumors. An ointment of it is very valuable in many of the above diseases. It should never be given internally, in plethora, or where there is much determination to the head."

Digitized by Google

STROPHANTHUS (Strophanthus)

First mentioned in edition of 1890. Official in later editions, 1900 and 1910. The official drug, *U. S. P.*, is the seed of *Strophanthus Kombe* or of *Strophanthus hispidus*.

The genus *Strophanthus*, which produces this drug, is chiefly African. It belongs to the *Apocynaceæ*, (tribe echitideæ of this order), and is distinguished from the other tribes chiefly from having its anthers united, after the manner of the *Asclepiadaceæ*. *Index Kewensis* mentions seventeen species of strophanthus, Bentham and Hooker eighteen species, Pax (495) twenty-five species, and the number is being rapidly augmented, as the flora of Africa becomes better known. Plants of the genus have usually woody stems, emitting a milky juice when wounded, and are generally twining vines. The seed of commerce is probably collected from various species indiscriminately, which have been classified and differentiated by Pax, Planchon, (512), Hartwich (304), Holmes (322), Blondel (80) and others. Space will permit us to mention only the two species which are acknowledged to be the principal source of the drug.

Strophanthus hispidus, D. C., is one of four species described by De Candolle as early as 1802, and is the species to which the drug was first ascribed. Its habitat is Senegambia and Guinea, and other parts of western Africa. Its stem is a twining, milky shrub, with opposite, hirsute leaves, hence the name *hispidus*, bristly, hairy. The seed, which bears a slender style terminating in a plumose pappus consisting of long hairs, is the part used in medicine. Hartwich calls special attention to the fact that the hairs of strophanthus seed are very sensitive to moisture, spreading horizontally in dry air, and becoming erect in moist atmosphere. He suggests

Digitized by Google

that the pappus would thus make an hygrometer sufficiently sensitive for practical purposes.

Strophanthus Kombe, Oliver, is a similar plant, native, however, of eastern Africa. It was at first referred to *S. hispidus*, and by some is still considered to be but the Oriental form of this species. It has the same hirsute leaves, but more coriaceous. The sepals are shorter than the corolla tube, and the cymes are fewer flowered than in *S. hispidus*.

Although the genus strophanthus was thus established by De Candolle as far back as 1802, it was not until the early sixties that the drug came to the general notice of Europeans as being one of the arrow poisons used among the native African tribes, there being two kinds of arrow poisons derived from this source, one prepared on the west coast of Africa (Senegambia, Guinea and Gaboon), called *inee* or *onaye*, which is derived from *Strophanthus hispidus*, D. C. This is on the authority of Hendelot, who observed the plant yielding this poison in Senegambia at the river Nunez (246). A specimen of this arrow poison was sent to Europe and investigated by Pelikan in 1865. (*Comptes Rendus*, 1865, vol. 60, p. 1209).

On the east coast of Africa, the *kombe* or *gombe* poison was in use by the Manganjah tribe, located near Lake Nyassa on the banks of the river Shire, a tributary of the Zambesi River. Consul Kirk in Zanzibar, in 1861, established that this poison originated from a strophanthus species, and forwarded specimens to Professor Sharpey in England for the purpose of investigation (246). Subsequently, in 1865, Livingstone's famous reports brought the kombe poison to a more general notice among Europeans (387). This species of stro-

Digitized by Google

phanthus was at first considered identical with *S. hispidus, D. C.*, but the plant was shown by Oliver in 1885 to be distinct from the latter, and justified the establishing of a new species, *Strophanthus Kombe.*

The physiological features of strophanthus as a powerful cardiac were recognized by the first investigators (Sharpey, 1862; Pelikan, 1865; Fraser, 1871). Livingstone reports the observation of Consul Kirk that the poison remarkably reduced the pulse, but the drug was not authoritatively recognized by the medical profession until about the year 1885.

Notes on Arrow Poisons.—Under the heading Hyoscyamus, which see, we referred briefly to the ordeal poisons of Africa. Among various aboriginal tribes, arrow poisons are in common usage in warfare, as well as in hunting. While in Africa we find strophanthus yielding the "*inee*" and "*kombe*" poisons, in the Himalaya Mountains, in Nepal, *Aconitum ferox* is used for a like purpose, and *Antiaris toxicaria* or upas tree in Java, and Cumane in South America. Nor are such poisons confined to vegetable origin. Livingstone cites a poisonous caterpillar employed in South Africa, and suggests that the animal probably derives its poison from the plant on which it feeds. Lewin mentions in this connection Diamphidia simplex, an underground crysalis.

As a rule, the African arrow poisons do not consist of single substances, but of compounds made up of various roots and leaves difficult to identify, botanically and chemically. The natives are very reluctant about disclosing the origin or the manner of preparation of their arrow poisons, and only the initiated few among them are acquainted with the art. When comes the time to

Digitized by Google

concoct the arrow poison, one man betakes himself into the forest's depths, far away from human habitations. He frees the seeds of strophanthus from their hairy appendages, (which by the way are an article of commerce, serving in the making of vegetable silk), and pounds them to a pulp in a mortar; he then adds water and the expressed juice of the rind of a tiliaceous species yielding a gum that serves to make the poison stick to the arrow. The poison thus prepared is then smeared upon the shaft, to a length of about six inches. It is said that game wounded by an arrow poisoned by strophanthus dies at once, seldom being able to move a hundred yards. The flesh of animals killed in this way is eaten without any evil effect, the only precaution taken, being either to cut out and exclude the flesh surrounding the wound, or to squeeze into it the sap from a branch of the baobab tree (*Adansonia digitata*). Elephants and hippopotami can not be destroyed in this manner, as they do not respond to the amount of poison an arrow can carry.

The pigmies of Africa use five ingredients in compounding their arrow poisons, and three to make their antidote to this poison. Surgeon Parke was so fortunate as to secure detailed information with regard to the source of these ingredients. (*Pharm. Journ.*, Vol. XX, 1890–91, pp. 917 and 927). This poison is not connected with strophanthus; it has as its basis some species of *Strychnos*, and the bark of *Erythrophlæum guineense*, Don, the tree that yields the "red-water ordeal" of African tribes.

The *ouabaio* poison of the Somali deserves here special mention, because its active principle, *ouabain*, is believed to stand in close connection with *strophan-*

Digitized by Google

thin. The ouabaio poison, liberally referred to by Burton, according to our present state of knowledge is derived from a species of *Apocynaceæ*. The making of this poison among the Somali is attended with the same mystery thrown about the strophanthus arrow poison. The wood is chipped and then boiled with water in an earthenware pot for hours or even days, until a pitch-like extract is obtained, which is smeared upon the iron arrow point. To prevent the poison from rubbing off, the barb is surrounded with parchment-like prepared goat skins or plant fibers, which are removed immediately before use. To test this poison, the Somali scratches his arm until the blood flows; he then applies the poison to the lower end of the bloody pool, and watches the blood coagulating from below upward, estimating thereby its virulence. This appears to anticipate some phases of scientific thought—such as the blood test for the cobra virus.

In 1882, some roots, stems and leaves of the plant yielding the Somali poison were sent to France by Revoil and investigated by Arnaud. In 1888 Arnaud obtained from similar specimens an active principle, an amorphous glucosid that he called *ouabain*. For this substance he arrived at the formula $C_{30}H_{46}O_{12}$. This differs by the group CH_2 from the formula for *strophanthin*, $C_{29}H_{44}O_{12}$, which he obtained from *S. hispidus*, D. C. He therefore concluded that *strophanthin* represents the higher homologue of ouabain. Besides, both substances have identical physiological action, which differs in degree only.

Pharmacopeial Record of Strophanthus.—Because of its recent introduction into medicine, only late editions of the different Pharmacopeias carry strophan-

Digitized by Google

thus. Nor are the various Pharmacopeias uniform as regards the strength of its preparations, or their manipulation. The *German Pharmacopeia* of 1890, for example, directs for the tincture a strength of 1:10, while the *British Pharmacopeia* (additions of 1890), the *Austrian*, 1889, and the *U. S. P.*, 1890, direct a strength of 1:20. According to the British and Austrian editions, the fatty oil is to be previously removed by ether. The German directs the fatty oil to be removed by cold pressure, while the *United States Pharmacopeia* gives no special direction for the removal of the oil.

In 1889, Mr. Beringer[1] pointed out that the tincture of strophanthus should not be prescribed in aqueous solution, because the bitter principle undergoes some change in aqueous solution by standing for a few days, thereby becoming far more toxic than when recently prepared.

To the firm of Burroughs, Wellcome & Company, London, (677, 678), is largely to be credited the position occupied by strophanthus in the medical lore of the present day. This is due chiefly to the efforts of Mr. Henry S. Wellcome, through his friend, Henry M. Stanley, the African explorer.

STYRAX (Storax)

First mentioned in the Philadelphia edition of the 1830 *U. S. P.*, as "The concrete juice" of *Styrax officinale*. The New York edition of 1830 does not name styrax. The 1840 and 1850 editions follow the 1830 (Philadelphia) edition. In 1860, and following, the source is said to be from *Liquidambar orientale* (*orientalis*). It is official in 1910.

Styrax is the product of a tree native to the southwestern part of Asia Minor and the adjacent islands. According to Krinos, of Athens, 1862, the earliest allu-

[1] (*Am. Journ. Pharm.*, 1889, p. 454).

Digitized by Google

sions to styrax were made by Aĕtius (6) and Paulus Ægineta (494), 1567. The early Arabian physicians were acquainted with styrax and its methods of production. The Russian Abbott of Tver, 1113–15, describes the tree as found by him in his travels through Asia Minor. Styrax reached China as early at least as 1368 by means of Arabian caravans, but it is now shipped to China by way of the Red Sea and India. Its use in medicine combined with other substances is restricted mainly to an external application in skin diseases. It has, however, been recommended for internal use, and in former times it was a constituent of empirical compounds designed for internal medication.

SUMBUL (Muskroot)

Official from 1880 to 1910. It is not mentioned in earlier editions of the *U. S. P.*

Musk root, *Ferula Sumbul*, was first introduced into Russia as a substitute for musk, and was known in Germany in 1840 as a Russian product. Its history is to the effect that in 1869 a Russian traveler, Fedschenko (240), discovered the plant in the northern part of the Khanat of Bukhara, 40° N. Lat. Sumbul has no authentic position in medicine, other than that it crept into the *British Pharmacopeia* in 1867 as a substance that had been recommended as a substitute for musk in cholera. This gave it credit elsewhere.

TAMARINDUS (Tamarind)

Official in every edition of the *U. S. P.* from 1820, excepting that of 1910.

The tamarind, *Tamarindus indica*, is a handsome tree, indigenous to tropical Africa. It is also found

Digitized by Google

throughout India, Java and Yemen, and has been naturalized in South America as well as in adjacent tropical islands, such as the West Indies, also in Mexico, as the writer found when in La Paz, Lower California. The ancient Greeks and Romans seem not to have known the tamarind. If known to the Egyptians, it was neglected by their authors, although Sir Gardner Wilkinson (688) states that tamarind stones were found in the tombs of Thebes, a statement not confirmed by specimens of the contents of tombs in the British Museum. The ancient Sanskrit writings mention tamarind, and the fruit was known to the Arabians as *Indian dates*, under which name it was mentioned by early authors, such as Avicenna (30) and others, including Alhervi (2) of Persia. Credit is given the Arabians for the distribution of the drug and its uses, it passing from them, with other Eastern products, into Europe, through the famous school of Salernum. Tamarinds have been used in their native countries in the making of a cooling drink much relished by persons afflicted with fevers, in which direction they have been also employed in medicine throughout the civilized world. It would be well if the modern physician were more familiar with the grateful, home-made drink that tamarinds afford the parched fever-sufferer.

Dymock, accepting that the tamarind is a native of India, gives an interesting account of its history and uses. From this we quote, as follows:

"There appears to be little doubt that the Tamarind tree is a native of some part of India, probably the South. It is found in a cultivated or semi-cultivated state almost everywhere, and the fruit, besides being an important article of diet, is valued by the Hindus as

Digitized by Google

a refrigerant, digestive, carminative and laxative, useful in febrile states of the system, costiveness, etc. The ashes of the burnt suber are used as an alkaline medicine in acidity of the urine and gonorrhea, the pulp and also the leaves are applied externally in the form of a poultice to inflammatory swellings.

"The Sanskrit names of the Tamarind are Tintidi and Amlika. The word 'Tamarind' appears to be derived from the Arabic Tamar-Hindi (Indian date), and it was doubtless through the Arabians that a knowledge of the fruit passed during the Middle Ages into Europe, where, until correctly described by Garcia d'Orta, it was supposed to be produced by a kind of Indian palm.

"The author of the *Makhzan-el-Adwiya* describes two kinds, viz., the red, small-seeded Buzerat variety, and the common reddish brown. The first is by far the best." (Dymock, *Pharmacographia Indica*, v. I, p. 532.)

TARAXACUM (Dandelion)

Introduced in *Pharmacopeia* of 1830 (both editions). Official in all editions following, including that of 1910.

The dandelion, *Taraxacum officinale*, is a plant familiar to all, being found throughout the whole of Europe, Central Asia and North America, even to the Arctic regions. Although the word *Taraxacum* is usually considered to be of Greek origin, there is no authentic record that the plant was known to the classical writers of Greece and Rome. The herbal of Johann von Cube (173), 1488, gives it a position under the name *Dens leonis*. It is mentioned by Rhazes in the 10th century, and by Avicenna (30) in the 11th, and it was used in Welsh medicine in the 13th century. In domestic medieval medication and as an ingredient of many popular

Digitized by Google

American "bitters" and "blood purifiers," taraxacum was extensively employed. It yet enjoys a high reputation as a home remedy. Dandelion wine is an alcoholic liquid made by fermentation of a solution of sugar mixed with dandelion flowers. The province of the flowers is that of a flavor. Professor L. E. Sayre has given taraxacum much research. (See *Proceedings of the American Pharmaceutical Association.*)

TEREBINTHINA (Turpentine)

Official in every edition of the *U. S. P.* from 1820, excepting that of 1910, from which it is dropped.

The sticky juice of many trees, as the pine, larch, and other coniferous trees, is known by the general name *Turpentine*, qualified by an adjective descriptive of its botanical origin or the country producing it; for example, Strasburg turpentine, Canada balsam, etc. This resinous, balsamic exudation has been used from all times as a balsam or pitch, or, when the wood of the tree is subjected to the action of heat, as a product of decomposition known as tar. This writer, (1906), observed a fragrant oleaginous tar brought into Smyrna in sheepskins from the interior of Asia Minor, which enjoyed a domestic popularity in that part of the country. The Indians of North America employed Canada balsam as an application to wounds, it being for such purposes an excellent antiseptic dressing (see *Indian Captivities*, Guile's Narrative) (198). The distillate of the natural turpentine had once a widely known domestic use in America as a remedy for worms, whilst the resin (rosin) which remains after the distillation of the spirit, is yet much employed in domestic treatment of the horse. All these forms of turpentine,

Digitized by Google

as well as the empyreumatic products of many related trees, have been known to the common people, as a rule, from the earliest records of history. The last editions of the *Pharmacopeia of the United States*, under the title *Oleum Terebinthinæ Rectificatum*, direct that the spirit obtained from the distillation of turpentine, usually obtained from the *Pinus palustris* (*Pinus australis*), be purified by redistillation from a solution of sodium hydrate, former editions, e. g. 1890, employing lime water for this purpose.

THYMOL (Thymol)

Introduced into the *U. S. P.* in 1880. Official thereafter, including the Ninth Revision, 1910.

Thymol is a product of *Thymus vulgaris*, a native of Portugal, Spain, Southern France, Italy and the mountainous parts of Greece. For several centuries it has been cultivated in England as a garden plant, and has long been known to yield a highly aromatic, essential oil. Under the name *camphor of thyme*, an apothecary of Berlin named Neumann, 1725, described this substance, which was called *Thymol* by Lallemand (369a) in 1853, thus giving a name to a substance that, in little use in itself, had in its natural association and combination as a part of oil of thyme ever been valued in domestic medicine, as well as by the medical profession. Under the name *oil of origanum*, oil of thyme has been a popular product obtained by the distillation of this herb, being used as an ingredient of domestic liniments and in veterinary medicine. Its use by the medical profession is even yet much limited.

Digitized by Google

TRAGACANTHA (Gum Tragacanth)

Official in all editions of *U. S. P.*, from 1820 to 1910. The present official source of tragacanth is the *Astragalus gummifera* or other species of Astragalus of Asia.

This gummy exudation, *gum tragacanth*, is a gift of Asia Minor, the shrub yielding it being very widely distributed. To locate its first use exactly, would be to antedate historic records. It has ever been before the people in the cradle of humanity, where as a natural product it has always been employed. Theophrastus (633), three centuries B. C., described it and located its origin. Dioscorides, a Greek writer, and Arabian writers, gave it due attention. In fact, it would perhaps be as difficult to locate the first use of wheat, as the first use of tragacanth.

However, until a moderately recent period, only the knotty yellow or brown natural exudation was found in commerce. The natives next learned that by cleaning the bases of the bushes and incising the bark with a knife, ribbons of a pure white or semi-transparent nature could be produced. This is now the favorite form.

Tragacanth comes into Smyrna from the interior of Asia Minor, and from Persia and Armenia. Professor Thomas H. Norton, U. S. Consul at Smyrna in 1906, when this writer visited the Orient, described its collection about Harput, Turkey. Tragacanth of commerce is a conglomerate mixture, good, bad and indifferent, as obtained from the caravan. In Smyrna it is sorted into grades, based mainly on its color. This writer took much interest in the tragacanth problem, and made many photographs of the Smyrna warehouses where girls were engaged in sorting tragacanth and nutgalls; dealers in the one product handling also the other.

Digitized by Google

TRITICUM (Couch Grass)

Introduced into *Pharmacopeia* in 1880. Official thereafter, through 1910.

Couch grass, *Agropyron repens*, is a weed widely diffused throughout Europe, northern Asia, the Caspian region, North and South America, even to Patagonia and Terra del Fuega. The ancients were naturally familiar with this grass with a creeping root-stalk, but it is impossible to determine the species valued by them. Dioscorides (194) ascribes to the decoction a value in calculus and suppression of urine. This use of triticum is corroborated by Pliny and again by the writings of Oribasius (479a) of the third century. Practically all the medieval herbals figure triticum, as in Dodonæus (195). As a domestic remedy it has ever been in common use, and in the form of a decoction is yet much employed in mucous discharges from the bladder and in other affections of the urinary organs.

ULMUS (Elm Bark, Slippery Elm)

Official in every edition, from 1820 to 1910.

"Slippery elm," *Ulmus fulva*, is the inner bark of a middle-sized tree found abundantly in the natural woodlands of the Central and Eastern United States, from Canada to the south. The Indians and early settlers of North America valued it highly as a poultice. In certain skin diseases they used it as an external application, and also as a soothing drink in fevers. In bowel affections they employed a cold decoction. Schöpf (582), 1787, refers to it as "salve bark." An infusion made by digesting this inner bark, shredded, in cold water has, after the teaching of the Indians, ever maintained a high reputation in domestic North American medicine in fevers, and especially in diar-

Digitized by Google

rheas connected therewith. The mucilaginous qualities render the powdered bark peculiarly adapted to the making of poultices, and in this direction it was known to all the early settlers of America, and was by them introduced to the medical profession.

UVA URSI (Bearberry)

Official in every edition of *U. S. P.*, from 1820 to 1910.

Bearberry, uva ursi, (*Arctostaphylos Uva ursi*) (Linné), which takes its name from the fact that its berries are eaten by the North American bear, is a low evergreen shrub, common to the northern countries of Europe and America. The leaves, which are used in medicine, are an article of commerce in the northern sections of Europe, America, and some parts of Asia. Being used in tanning, in Sweden and Russia, according to Rafinesque (535), they established the well-known "Russia" leather. The astringent leaves were once highly valued in Europe, but have since fallen into disuse. The domestic employment of the drug introduced it to American medicine, Drs. Wistar, Barton (43) and Bigelow (69) recommending a decoction of it as a wash for leucorrhea and as an injection in gonorrhea and catarrh of the bladder. For these purposes, as based on its domestic employment, the plant has its professional record, but it has never been very important.

VALERIAN (Valerian)

Official in all editions of *U. S. P.*, from 1820 to 1910.

The herbaceous perennial *Valeriana officinalis* is found throughout Europe from Spain to Iceland, extending also from the Crimea over northern Asia into China. It not only grows wild, but in England espe-

Digitized by Google

cially is cultivated as a drug plant. It was known to the Greeks and Romans, and the *wild nard* described by Dioscorides (194) and Pliny (514) is supposed to be a species of valerian, of which nine species are found in Asia Minor, in addition to *Valeriana officinalis*. The name *Valerian*, however, was not used by the classical writers, occurring first in the 9th and 10th centuries A. D. It is found in the Anglo-Saxon names of home remedies, and in domestic books, as early as the 11th century. Saladinus (570) of Ascoli, 1450, directed that the root be collected in the month of August. In medieval days in England, the flavor of valerian was considered by the common people a delightful addition to broths and pottages, Gerarde (262) in his *Herball*, 1567, remarking that the poorer classes of people in the north of England did not consider such forms of food worth anything without it. Strangely enough, the odor of valerian, now considered exceedingly disagreeable, was in the 16th century accepted as a perfume, and as a perfume it is still used in the Orient. In this connection we will add that we have known valerian to be a constituent of an American perfume very popular with some ladies, but exceedingly unpleasant to some others. In domestic medicine, a tea from the root of valerian has been employed as a stimulant and antispasmodic in nervous diseases peculiar to females.

VANILLA (Vanilla)

Introduced into the *U. S. P.* in 1860. Official in all subsequent editions, through 1900. It was dropped in 1910, *Vanillinum* (Vanillin) taking its place. Vanillin was first mentioned in the edition of 1900.

The plant that produces vanilla is an orchid, native of the tropical forests of Mexico, but now grown in

Digitized by Google

ROSA GALLICA, Page 272 (No. 2)

Upper. MULBERRY TREES, STRIPPED FOR SILK WORMS

Lower. MULBERRY LEAVES FOR FEEDING SILK WORMS

(Near Brussa, on the foot of Mt. Olympus. A city of silk industry.)

Photographed by Mrs. John Uri Lloyd.

Digitized by Google

Digitized by Google

many warm countries, as Brazil, Honduras, Java and the West Indies. Mr. C. G. Lloyd has seen it in most of the botanical gardens in Jamaica, Dominica and Trinidad, although as an article of commerce it is grown in but one island, the French island of Guadaloupe.

As has been shown by Darwin, most orchids depend on insect fertilization, and vanilla is no exception. In Mexico, where it is native, it is naturally fertilized by insects, but when raised in any other country, it must be fertilized by artificial means.

The flowers of vanilla are produced in axillary bunches of eight or ten. They are of a pale-yellow color, about two inches in diameter. They have the usual orchidaceous structure, but are more regular in appearance than most orchids. The fruit is a pendant pod five to ten inches long, an inch or more in circumference when fresh, and containing myriads of minute seeds. These pods, when properly cured and dried, are the "vanilla" of commerce, so named from the Spanish name for pod, *Vaina*, hence *a small pod*.

The plant that produces this pod is a vine with a thick, succulent stem and entire, thick, smooth, pointed leaves. It is furnished with numerous aerial roots, with which it clings to its support. Some regard the plant as a parasite, deriving its nourishment from the tree to which it clings; others as an epiphyte, (true of many orchids), living entirely on moisture and the nourishment derived from the air. (John M. Maisch, *Am. Journ. Pharm.*, 1892, p. 555). Neither opinion is exact. After the vanilla plant has established itself, it will continue to grow, even if its connection with the ground is severed, and it will throw out new roots which

Digitized by Google

reach and penetrate the ground. Hence it is to some extent epiphytic. But should it fail to establish its connection with the ground, it finally withers and dies. (Charles A. Hires, *Am. Journ. Pharm.*, 1893, 571–584; see also same journal, 1892, p. 554, and 1890, p. 308). Vanilla is in no sense a parasite. In the West Indies it is grown in bamboo joints, with a very little earth, hung in branches of trees.

As an evidence of the vitality of the vanilla plant, the following, from Miller's *Gardener's Dictionary*, (5th ed., London, 1763), may be quoted:

"I had some branches of this plant which were gathered by Mr. Robert Miller at Campeachy, and sent over between papers by way of sample, and had been at least six months gathered when I received them; but upon opening the paper I found the leaves rotten with the moisture contained in them, and the paper was also perished with it, but the stems appeared fresh; upon which I planted some of them in small pots and plunged them into a hotbed of tanner's bark, where they soon put out leaves and sent forth roots from their joints."

Early History.—The conquering Spaniards found vanilla in use as a flavor for cacao among the Aztecs of Mexico, and naturally made the plant known to Europe. (A. V. Humboldt, *Essai Politique sur le Royaume de la Nouvelle Espagne*. 1811. Vol. II, p. 338; Vol. III, p. 198 et seq.) It was then described and figured by Hernandez, (314), the "Pliny of the Spaniards," who in his history of Mexico mentions it under both its botanical name, "*Aracus aromaticus*," and its vernacular name, "tlilxochitl." Clusius (153) mentions it in 1602 as "lobus oblongus aromaticus." Pomet (519) in

Digitized by Google

1694, reports the use of vanilla in France to flavor chocolate and sometimes to perfume snuff. As early as 1721 vanilla was introduced into the *London Pharmacopeia*, and in 1739 Mr. Ph. Miller planted some specimens (*Vanilla aromatica*, Swartz) in the Chelsea botanical garden. In 1724 P. Labat (365), a Catholic missionary, reports (from hearsay), the abundant occurrence of vanilla in the "terre ferme" of Cayenne, from which place specimens were forwarded to him in 1697 to Martinique, where he cultivated the plant and for eight years observed its habits. He also planted vanilla in Guadaloupe. In 1750 P. Gumilla met vanilla in the Orinoco country. (Flückiger.) But to Humboldt (331) we owe the first authentic and detailed report on Mexican vanilla. The Mexican province of Oaxaca supplied the first vanilla export to Spain, and the bean was discovered in this province by De Menonville in 1777. (*Gardener's Chronicle*, May 23, 1874, *Am. Journ. Pharm.*, 1874). According to old archives, (Hires), vanilla forests have been in cultivation at Papantla, near Vera Cruz, as early as 1760.

The species yielding the finest flavored vanilla, later named *Vanilla planifolia*, Andrews, was imported from America into England by Charles Greville, this flowering in his collection at Paddington in 1807. Specimens of this plant were later transferred to Paris and Belgium, from whence the botanical gardens of Reunion and Java were supplied. In 1830 Neumann introduced the artificial fertilization of vanilla in the Jardin des Plantes at Paris, and in 1837 Professor Morren did the same at Liege. The Java plantation, started in 1841, in the year 1897 supplied the Dutch market, solely. (Beringer).

Digitized by Google

The Reunion plantation, according to Delteuil, was started by Perrottet (239) in 1839. The cultivation of vanilla for the purpose of export was subsequently introduced into other French colonies, e. g. into Mauritius by M. Richard (550), into Guadaloupe in 1875, Martinique, Ste. Marie (near Madagascar), and into Tahiti of the Society Islands. In Jamaica, individual attempts to cultivate vanilla are on record. Its cultivation in Calcutta, however, according to reports by Dr. King, seems to be a failure. (*Phar. Journ. & Trans.*, Nov., 1876). Suggestions have been made of a more energetic prosecution of its culture in Jamaica, in Venezuela and Guiana; also of its introduction into the extreme southern parts of the United States, Florida and Texas. (*Am. Journ. Phar.*, 1857).

Cultivation of Vanilla.—Vanilla may be propagated from seeds, or, as the vine produces adventitious roots, by cuttings. The latter method is almost exclusively employed, conducted now according to methods established more than a hundred years ago. (See article by Ph. Miller in the *Gardener's Dictionary*, 1763). A warm and moist climate, sandy soil, moist but not marshy, a mixture of shade and sunshine, the shade predominating, are essential to its successful cultivation. The temperature should average from 75 to 80° F., but should not fall below 65° F. in winter. An extremely high temperature is likewise disastrous. Dr. King of the Calcutta Botanical Gardens (1876), reported that an extremely high temperature caused pod-laden plants to drop their fruit prematurely.

Vanilla plantations in Mexico differ from those in the French dominion (Reunion), in that in Mexico the vanilla growers permit the vine to climb trees to any

Digitized by Google

height and in any direction, while in the French plantations the vine is guided along trellises in such a way as to permit of easy access. Another distinction has been cited in that the Mexicans rely on natural methods for fertilization of the flowers, while in Reunion the flowers are fertilized artificially.

The tendrils should be tied with several flat strips, not round twine, as the latter seems to strangle the plant. The bast or fiber from the leaf of *Pandanus vacoa* is used for this purpose. The plantation should not be too near the seashore, unless protected by forests to ward off the salt air, which sickens the plants. Flowers appear in March, and continue until May.

FECUNDATION OF THE FLOWERS IN REUNION.—Observation and some reflection have shown that the yield of vanilla may be improved considerably by artificial fecundation of the flower. In Mexico, where fertilization is left to natural influences, the wind and the action of insects, twelve to twenty-six inches of vine will produce about forty flowers, and only one pod, while all the flowers might have been artificially fertilized. The obstacle to spontaneous fertilization being the interposition of the labellum, (the upper lip of the stigmatic orifice), between the stigma and the anther, artificial fecundation was formerly effected in Reunion by merely cutting away this obstacle. But later, following the observation of a Creole slave, it was found as easy simply to slip the labellum from under the anther, whereby the latter organ comes into direct contact with the stigma, thus effecting fertilization. Fecundation must be carried out judiciously, to prevent the degeneration of the fruit; it is, for example, possible to obtain as many as 3,500 pods on a single plant, but such a

Digitized by Google

demand upon the plant's vitality would cause it to perish before the pods could ripen.

GATHERING THE VANILLA.—The vine blossoms from March to June; the pod matures in about two and one-half months, but does not ripen until January or February. Some persons consider that a greenish-yellow color of the pod establishes its ripeness, while others contend that the only sure criterion is the crackling sound produced when the ripe pod is pinched between the fingers. Unfortunately, most vanilla is picked before it ripens, as early as October or November, one reason being a demand for the new crop.

CURING VANILLA.—The value of vanilla depends greatly on the success of the curing process, for during the manipulation the flavor of the bean is developed by a peculiar, artificial fermentation. J. Ch. Sawer (574) makes the following statements with regard to the processes employed in Mexico, and also in Reunion, Peru and Guiana:

CURING IN MEXICO.—From Sawer we extract as follows:

"The pods are placed in heaps under a shed, protected from sun and rain, and in a few days, when they begin to shrivel, they are submitted to the sweating process. If the weather happens to be warm and fine, the pods are spread out in the early morning on a woolen blanket and exposed to the direct rays of the sun, the dark coffee-color which they acquire being deeper in proportion to the success of the sweating operation. In cloudy weather the vanilla is made into bundles; a number of them are packed together into a small bale, which is first wrapped in a woolen cloth, then in a coating of banana leaves, and the whole, inclosed in a mat, is

Digitized by Google

firmly bound and sprinkled with water. The bales containing the largest beans are now placed in an oven heated to 140° F. When the temperature of the oven has fallen to 113° F., the smaller beans are introduced, and the oven is closed tight. Twenty-four hours afterward the smaller beans are taken out, and twelve hours later, the larger ones. During the sweating the vanilla acquires a fine chestnut color. It is now spread on matting, exposed to the sun every day for about two months, and when the drying is nearly complete, is spread out in a dry place, and finally tied up in small packs." (*Am. Jour. Phar.*, 1881, pp. 345–349; see also *Pharm. Journ. and Trans.*, 1880–81, pp. 773–775).

Finally, the bundles are packed in cans containing forty bundles each, and four or five of these cans are packed in a case of Mexican red cedar, which is the most suitable and plentiful wood in the vanilla land. These hand-made cases cost from $2 to $3, but there are no saw mills to cheapen the lumber (in 1897). Finally they are covered with fiber matting and transported to the seashore by caravans of mules or burros, each beast having two cases strapped to its back, and during the journey it is watched by two or three attendants. So opposed are the natives to the introduction of a railroad, as to have led them to hang a civil engineer who desired to survey the country. (Hires).

Commercial Varieties.—Beringer, in 1892, (*Am. Jour. Phar.*, 1892, pp. 289–294), described the following species of vanilla found on the American market:

Mexican, Bourbon, Seychelles, Mauritius, Tahiti, South American vanilla, and vanillons.

The *Mexican* vanilla, on account of its superior aro-

Digitized by Google

matic flavor, commands the highest market price. Mr. Beringer describes it as follows:

"Prime Mexican vanilla is from eight to ten inches long, flattened, and about three-eighths of an inch in diameter at the broadest part. Its upper end or end of attachment tapers gradually for about one-quarter of the length of the pod, and is usually curved and slightly twisted toward the point. The lower end is but very slightly attenuated. The color is a dark brown, and the odor is pleasant, aromatic and characteristic. The surface is ridged longitudinally, the ridges being interspersed with finer striations and warty excrescences. The pods feel firmly plump, and while fresh the surface is somewhat viscid, but nevertheless there is a roughness to the touch which becomes more pronounced as it gets older and dryer. Acicular crystals commence to form at the ends, and gradually extend over the surface. The interior is filled with numerous black seeds and a small quantity of pulp."

The crystals covering vanilla beans that have been cured are called "frost." Until 1859 they were believed to consist of *benzoic acid*, but in that year Gobley established its distinction from that substance, and gave it the name *vanillin*, believing that in this substance was found the aromatic principle of vanilla. However, the subsequent artificial production of vanillin has not been able to displace the use of the beans. Neither has the amount of the vanillin present in vanilla beans been accepted as a criterion of their quality. Suffice it to say that the best Mexican vanilla has been found to contain only 1.69 per cent vanillin, while Bourbon contained 2.48, and Java 2.75 per cent vanillin. Sometimes benzoic acid is dusted over an in-

Digitized by Google

ferior bean to give it the appearance of a high-grade article. This may be recognized, according to Schimmel & Co., (1888), by abstracting the benzoic acid crystals with sodium carbonate, adding sulphuric acid and metallic magnesium or zinc; the odor of oil of bitter almond will then be developed.

STATISTICS.—Formerly the Oaxaca and Vera Cruz provinces were the principal vanilla-growing districts in Mexico, yielding in 1802 1,793,000 pods. (*Humboldt*). In 1897 Papantla and Misantla were the center of vanilla culture (*Hires*), and the crop had increased from 700,000 pods in 1866 to the enormous amount of 15,000,000 pods in 1893, this figure being the average for the preceding ten years. From Vera Cruz only 100,000 pods were received. The United States imports in 1891 (*Beringer*) were: Mexican, 135,875 lbs., Reunion, Seychelles and Mauritius, 10,000 lbs., South America, 9,000 lbs., Tahiti, 5,000 lbs. In 1896 the total imports into the United States rose from 137,000 lbs. of the preceding year to about 237,000 lbs., representing a value of over $1,000,000. (*Oil, Paint and Drug Reporter*, Mar. 8, 1897, Supplement).

In searching for data concerning vanilla in 1897, we corresponded with Dr. V. C. Price, President of the Price Flavoring Extract Company, of Chicago, one of the heaviest consumers of Mexican vanilla in the world, and to him we were indebted for much information, including the statement that *the beans should be at least a year old* before they are extracted. He stated that they must be closely watched, in order to prevent them from moulding, and that after they mould lice quickly appear, and the value of the beans is rapidly destroyed. Dr. Price also stated that within the year the value of

Digitized by Google

Mexican vanilla had about doubled, and that no other bean is capable of making high-grade extract. The quoted prices of vanilla in 1897, per pound, were as follows: Best Mexican, $16; Bourbon, $12; South American, $6; Tahiti, $5; Brazil, $5. (*Amer. Druggist*, 1897, p. 214).

PHYSIOLOGICAL NOTES AND PHARMACOPEIAL RECORD.—A disease to which the name "vanillism" is given has been observed to afflict persons professionally engaged in the handling of vanilla. Humboldt states that the Spaniards abstained from the use of vanilla, as they ascribed to it a harmful influence upon the nervous system. Its use as a medicine has become obsolete in most countries.

The plant was official in the *Spanish Pharmacopeia* of 1817, but was not official in the edition of 1885. The *Pharmacopeia Portugueza* of 1876, however, carried it under the name of *baunilha*. The *London Pharmacopeia* adopted vanilla in 1721, but soon discarded it. It does not appear in recent *British Pharmacopeias*. Vanilla, from *Vanilla planifolia*, Andrews, is official in various editions of *German*, *French* and *U. S. Pharmacopeias*.

VERATRUM VIRIDE

(Veratrum, American Hellebore)

Mentioned in all editions of the *U. S. P.*, from 1820 to 1910. In all editions *preceding* 1880, Veratrum *album* (White Hellebore), is given equal prominence with *Veratrum viride*.

Veratrum viride is an American plant, known under the common names itch-weed, Indian poke, American hellebore and swamp hellebore. It is found in swampy soil and meadows East and South, and along streams, coming up among the earliest swamp plants. It often

Digitized by Google

grows with skunk cabbage, with which its root is sometimes mixed in commerce. Josselyn, 1672, first refers to it. He with others considered it the European *Veratrum album*. Following, Kalm, 1753, Cutler, 1785, Schöpf, 1787, Aiton, 1789, Barton, 1798, Bigelow, 1818, Thacher, 1821, Rafinesque, 1830, and all subsequent American botanists gave it attention, the earlier writers considering it to be *Veratrum album*, to which it is closely related. In 1742 the plant was introduced into Europe, (Loudon), but Aiton, 1789, states that to Collinson in 1763 is due the honor. Credit for the name is usually given Aiton, but is really due William Solander, a pupil of Linnæus.

Peter Kahn (350) states that *Veratrum viride* is very common in marshy places, and frequently causes the death of stock, which eat the young leaves in the spring; also that the settlers employed a decoction of the root to poison the seed-corn, to prevent birds from eating it; also that the root was used as an insecticide. Maisch considered the leaves innocuous. Frederick V. Coville informs us that sheep in the West fatten on the leaves and stems, and that stockmen call it Wild Indian Corn. Corn steeped in decoction of the rhizome (Cutler) poisons crows. Owing to its emetic qualities, the drug is seldom fatal to man, but overdoses are distressingly energetic, and although we have never known a fatal case from its use, veratrum is classed with substances to be used with care. With Professor A. J. Howe, M. D., veratrum was a great favorite. The drug was early known, (Thacher, Zollicoffer, Bigelow, etc.), but as is true of many other valuable American remedial agents, it has been much neglected. Its insecticide qualities and its emetic property led to its use by both

Digitized by Google

the Indians and the early American settlers, who used it both in form of ointment and in decoction.

American veratrum is conceded by all modern botanists to be a distinct species. It is so close, however, to *Veratrum album* of Europe, that the early explorers of America, and some of the earlier botanists, Michaux, Josselyn (345), Kalm (350), Schöpf (582), etc., thought it the same species. Certainly the rhizomes of both plants bear a close resemblance, even in their microscopical aspects. (E. S. Bastin, *Am. Jour. Phar.* 1895, p. 196).

VIBURNUM OPULUS (Cramp Bark)

Mentioned in but two editions of the *U. S. P.*, those of 1890 and 1900.

High cranberry, *Viburnum Opulus*, known also as cramp bark, is a shrub growing in swamps and damp localities of the northern United States. The bark of this shrub was used by the Indians (535) as a diuretic, a decoction being freely employed. According to Rafinesque (535), pills and plasters were also devised from this plant, and the bark was smoked instead of tobacco by some of the Western Indian tribes. The leaves of *Viburnum Opulus* and other species of *Viburnum* were used by the Indians as a tea, and also by the settlers of the southern states in early Colonial days. The domestic use of viburnum did not impress the medical profession to any extent until the day of Beach (49), as is evidenced by the fact that such conspicuous authorities as Zollickoffer (706), and even the *United States Dispensatory*, 1833 edition, neglected to mention either the plant or its uses. At present, authors who believe the direct physiological action of drugs essential to therapeutic usefulness, also neglect viburnum.

Digitized by Google

COLLECTING PERSIAN INSECT FLOWERS

Presented by Allaire Woodward & Company.

Digitized by Google

Digitized by Google

In 1913, Mr. Oliver A. Farwell, of Parke, Davis & Company (116a) established that the bark of *Acer spicatum*, under the name "Cramp bark," was being used instead of *Viburnum Opulus*. Investigation demonstrated that practically the total drug of commerce, at that date, was derived from this tree. Just when the substitution began has not been determined.

VIBURNUM PRUNIFOLIUM (Black Haw)

Introduced into *U. S. P.* in 1880. Official in all editions following, including that of 1910, which makes official the bark of *Viburnum prunifolium*, or of *Viburnum Lentago*.

Black haw, *Viburnum prunifolium*. The bark of this tree was employed in American domestic medication during the first part of the 19th century. The first authentic reference we have observed is in the *American Family Physician*, 1857, by Professor John King, M. D. (356), who describes the drug, and makes the statement that it acts as a uterine tonic, its uses, as given by Dr. King, being practically those now recorded of this remedy in current medical literature. In 1860 Dr. I. J. M. Goss, (*New Preparations*, 1878, p. 61), commended the drug, probably brought to his attention through the to him familiar writings of King, as well, possibly, as from its local use in his part of the South. (Dr. Goss lived in Atlanta, Georgia.) He introduced it into his own practice, and commended it to his professional friends. From this date "black haw" grew rapidly in favor, and through repeated notice in medical as well as pharmaceutical literature, came into extensive demand, being finally given a position in the *Pharmacopeia of the United States*. Being possessed of no toxic qualities or immediate physiological action, it is considered by some writers "valueless" in therapy.

Digitized by Google

XANTHOXYLUM (Prickly Ash)

Official from 1820 to 1910. In the editions of 1820 and (2nd edition) 1828, it was mentioned in the Primary List, but in following editions it was relegated to the Secondary List until 1880, when it became wholly official. Xanthoxylum of the *U. S. P.*, 1910, is the bark of *Xanthoxylum americanum* (Northern Prickly Ash of commerce), or of *Xanthoxylum Clava-Herculis*.

Prickly ash, *Xanthoxylum americanum*, is a shrub native to North America, being somewhat abundant in localities where it is found, between the Mississippi River and the Western States. Long a domestic remedy, it became a favorite in the Eclectic school of medicine by reason of its use during the prevalence of the Asiatic cholera in Cincinnati, 1849, when it was employed by them with great satisfaction. It had, however, a domestic as well as a seemingly professional record preceding that date, the same reaching back to the primitive medication of the Indians. Barton's *Collection* (43), Zollickoffer's (706) *Materia Medica*, 1826, and other authorities on the domestic remedies of North America mention xanthoxylum conspicuously, the latter writer stating that the berries were used to relieve the toothache, and a decoction of the bark in the treatment of rheumatic affections, whilst the country people employed an infusion of the berries in colic. It was therefore a popular remedy, possessed of marked carminative qualities that, impressing such men as Barton (43), Thacher (631), King (356, 357), Zollickoffer (706) and others, brought it into professional recognition. Prickly ask berries are used in large amount in some of the American proprietary remedies.

Digitized by Google

ZEA—STIGMATA MAYDIS (Corn Silk)

Mentioned in but two editions of *U. S. P.*, in 1890 and 1900.

Corn silk, *Zea*, or *Stigmata maydis*, seems to have crept into the notice of the medical profession in Europe before it had any conspicuity in America. In 1878 (*Revista de Madrid*) a Dr. Betherand mentioned it in print. Long preceding that date, however, a tea of corn silk had been employed in American domestic practice as a remedy for acute affections of the bladder. Dr. John Davis, a well-known Cincinnati physician of the highest reputation, repeatedly informed the writer that, in his opinion, a decoction of corn silk, together with a decoction of dried pods of beans, was the most effective of all diuretics he had employed in his practice, as well as being most satisfactory in acute cystitis. The *Medical News*, August 10, 1881, commended a decoction of corn silk in the above named directions, and in the *Therapeutic Gazette* (634), February, 1881, Professor L. W. Benson reported that in his practice the remedy acted very favorably and kindly. Following this, various contributions appeared in the foreign medical journals, one by Dr. Dufau in the *London Medical Record*, speaking of it as a little known, newly introduced remedy. Following this came many commendatory articles in European medical journals, which fact, together with the increased demand for the preparation, led to its introduction into the *Pharmacopeia of the United States*.

ZINGIBER (Ginger)

Official in all editions of *U. S. P.*, from 1820 to 1910.

Ginger, *Zingiber officinale*, a reed-like plant, native to Asia, has been introduced to most tropical countries,

Digitized by Google

growing freely in some parts of the West Indies, South America, Western Africa, Australia, etc. It was extensively used by the Greeks and Romans, who considered it an Arabian product because it came to them, among spices from India, by way of the Red Sea. It was an article of common import from the East to Europe from the 11th to the 13th centuries A. D., and probably for a long period preceding that time. Ginger was taxed as a spice, in common with pepper, cloves, galangal, cubebs, etc. It was frequently named in the Anglo-Saxon domestic works on medicine of the 11th century, and was used by the Welsh physicians (507) of the 13th and 14th centuries, being then next to pepper in common use. Marco Polo (518) observed it in China and India about 1280–90. In fact, ginger has been a spice and a domestic remedy from the earliest records, being extensively employed, both as a spice and as an aromatic stomachic. It is still a popular domestic remedy, as well as a favorite with many physicians.

Digitized by Google

BIBLIOGRAPHY

The text numbers in parentheses refer to corresponding numbers in the Bibliography. Had the full titles of the publications to which references are made followed each subject (Lobelia an example), voluminous repetition would have resulted. Inasmuch as nearly eight hundred authors are credited, embracing in the neighborhood of one thousand titles, such duplications would have much lengthened the volume.

As it is, many authors are credited in the body of the work or by footnotes. Several breaks in the numbers of the bibliography will be observed, due to rearrangements found necessary as the work progressed.

To the late Librarian of the Lloyd Library, Captain William Holden (deceased), and to his successor, Miss Edith Wycoff, the writer's thanks are due for assistance in the comprehensive compilation of this portion of the work.

---

1. Abet, F. J.
   Le Chimaphila umbellata (herbe à pisser): son action diuretique. Paris, 1889.
2. Abu Mansur Mowasik ben Ali al hervi.
   Liber fundamentorum pharmacologiæ. Vindobonæ, 1830-3. (German ed. Halle, 1893).
3. Acosta, Cristobal.
   Tractado de las drogas. Burgos, 1578. (Later editions in French, Latin, and Italian).
4. Actuarius, Joannes.
   De medicamentorum compositione. Basileæ, (1539).
   Methodi medendi libri sex. Venetiis, 1554.

Digitized by Google

5. Acuña, C. de.
Nuevo descubrimiento del gran rio de las Amazonas. Madrid, 1641.

6. Aëtius, Amidenus.
Librorum medicinalium tomus primus. Venetiis, 1534. (Greek text).
Librorum medicinalium, libri xvi. Basileæ, 1535. (Later editions).

7. Ainslie, W.
Materia medica. 2 v. London, 1826.
Materia medica of Hindostan. Madras, 1813.

8. Aiton, William.
Hortus Kewensis. 3 v. London, 1789.

9. Albert, P.
Observations sur le chanvre indigene. Strasbourg, 1859.

10. Albertus Magnus.
Alberti Magni ex ordine prædicatorum de vegetabilibus libri vii. Berolini, 1867.

11. Alexander Trallianus.
Alexandri Tralliani medici lib. xii. Lutetiæ, 1548. (Greek text). (Later editions).

12. Alibert, J. L.
Nouveaux elemens de therapeutique et de matiere medicale. Paris, 1804. (Later editions, French and Italian).

13. Allen, T. F.
Encyclopedia of pure materia medica. 12 v. N. Y. and Phila., 1874-9.

14. Alpherts, H. G.
De Brayera anthelmintica, vulgo kousso. Traj. ad Rhenum, 1853.

15. Alpinus, Prosper.
De balsamo dialogus. Venetiis, 1591. (Later editions).
De medicina Aegyptiorum. Venetiis, 1591. (Later editions).

Digitized by Google

Alpinus, Prosper.—*Continued.*
De plantis Aegypti liber. Venetiis, 1592. (Later editions).
De rhapontico. Lugduni Batavorum, 1718.

16. Altomari, D. A. ab.
De manna. Venetiis, 1562.

16a. Amatus, Lusitanus.
In Dioscoridis anazarbei de materia medicâ. Venetiis, 1553. (Later editions).

17. American Eclectic Review. Cincinnati, 1866-72.

17a. American Journal of Medical Sciences. Philadelphia, 1827-

17b. American Journal of Pharmacy. Philadelphia, 1825-

18. American Medical Journal. Cincinnati, 1856-7.

19. American Medical and Surgical Journal. Syracuse and Philadelphia. 1851-2.

20. American Medical Journal. St. Louis, 1873-

20a. Amoreux, P. J.
Essai historique et littéraire sur la médecine des Arabes. Montpellier, 1805.

21. Anderson, A.
Dissertation on the Eupatorium perfoliatum of Linnæus. New York, 1813.

22. Angelus à sancto Josepho.
Pharmacopœa Persica ex idiomate Persico in Latinum conversa. Lutetiæ Parisiorum, 1681.

23. Anguillara, Luigi.
Simplici, liquali in piu Pareri à diversi nobili huomini scritti appaiono. Vinegia, 1561.

24. Apicius, Cœlius.
De opsoniis et condimentis sive arte coquinaria libri decem. Amstelodami, 1709.

25. Arabian Nights. *See* "Book of the Thousand Nights and One." Vol xi, p. 745, and vol. xvii, p. 7.

Digitized by Google

25a. Arata, Pedro N.
Researches on Quebracho. (Pharm. Jour. Trans. 1878, p. 531). (Proc. Amer. Pharm. Assn., 1881, p. 231).

26. Archer, J.
A compendious herbal. London, 1673.

27. Athanasius, E.
Historiæ radicis scillæ marinæ physico-medicæ specimen i. Halæ, 1794.

28. Audouin, J. V.
Prodrome d'une histoire naturelle, chimique, pharmaceutique, et médicale des cantharides. Paris, 1826.

29. Aulagne, Emile.
Étude sur les Convolvulacées. Paris, 1881.

30. Avicenna.
Liber primus de medicina edidit. Patavie, 1479.
(Libri quinque canonis de medicina et antidotarium). Venetiis, 1486. (Later editions).

31. Backer, Gerard.
De radicum virtutibus medicis plantarum physiologia illustrandis. Amstelodami, 1829.

32. Bähr, B.
Digitalis purpurea. Leipzig, 1859.

33. Baillon, H.
Traité de botanique médicale cryptogamique. Paris, 1889. Revision des Aristolochées medicinaux. Paris, n.d.

34. Bain, J.
De la coca du Pérou et de ses préparations. Paris, 1877.

35. Balfour, J. H.
Description of the plant which produces the ordeal bean of Calabar. (Trans. Royal Soc., Edinburgh, xxii, 1860, pp. 305-312).
On the Aconitum ferox which has recently flowered in the gardens of the Edinburgh horticultural society. (Edinb. New Phil. Jour. xlvii, 1849).
Remarks on plants furnishing varieties of ipecacuanha. (Trans. Roy. Soc. Edinburgh, xxvi, 1872, pp. 781-788).

Digitized by Google

36. Balfour, Thomas.
Dissertatio de cortice peruviano. Edinburgi, 1774.

37. Ballard, E. and Garrod, A. B.
Elements of materia medica and therapeutics. Phila., 1845.

38. Barbier, J. B. C.
Traité élementaire de matière médicale. Paris, 1819.

39. Barbosa, O.
Libro dell' Indie orientale. *In* vol. 1, Ramusio, G. B. Delle navigationi et viaggi. 3 v. Venetia, 1563-74.

40. Bardili, C. G. A.
De Diosma crenata ejusque in morbis efficacia. Tuningæ, 1830.

41. Barnes, J.
Plants used in medicine. London, 1835.

42. Bartholow, Roberts.
Materia medica and therapeutics. New York, 1876. (Later editions).

43. Barton, B. S.
Collections towards a materia medica of the United States. Phil., 1798-1804. (2 ed. Phil., 1801; 3 ed. 1810. *Also* Bulletin Lloyd Library, No. 1).

43a. Barton, W. P. C.
Vegetable materia medica of the United States. 2 v., Phila., 1817-18.

44. Bartram, J.
Descriptions, virtues, and uses of sundry plants of these northern parts of America, and particularly of the newly discovered Indian cure for the venereal disease. Phila., 1751.

45. Bastin, E. S.
The starches in subterranean stem drugs. (The Apothecary, ii, 1893, p. 151).

46. Bauderon, Bricius.
Paraphrase sur la pharmacopée. 2 ed. Lyon, 1596. (Later editions).

Digitized by Google

47. Bauhin, J. and Cherler, J. H.
Historia plantarum universalis. 3 v. Ebroduni, 1650-1.

48. Bauhin, Kaspar.
Pinax theatri botanici. Basileæ, 1623. (Another edition, 1671).

49. Beach, Wooster.
American practice of medicine. New York, 1833. (Later editions).
Medical and botanic dictionary. New York, n. d.

50. Beauvisage, G. E. C.
Les galles utiles. Paris, 1883.

51. Becher, J. J.
Parnassus medicinalis illustratus. Ulm, 1662-3.

52. Beck, John B.
Lectures on materia medica and therapeutics. New York, 1851. (Later editions).

53. Becker, G. A.
Études botaniques, chimiques et toxicologiques sur la digitale pourprée. Strasbourg, 1864.

54. Bell, J. and Redwood, T.
Historical sketch of the progress of pharmacy in Great Britain. London, 1843. (Later edition, 1880).

55. Bengal, V.
Rhabarbarum officinarum. Tubingæ, 1752.

55a. Benjamin of Tudela.
Itinerary, translated and edited by A. Asher, 2 v., London, 1840-41. (Original in Latin, 1575).

55b. Bennett, A.
An experimental inquiry into the physiological action of theine, guaranine, cocaine, and theobromine. (Edinburgh Medical Journal, xix, 1873, pp. 323-341).

56. Bently, Robert.
On Actæa, or Cimicifuga racemosa. (Pharm. Journ. [2] ii, 1861).

Digitized by Google

57. Bentley, R. and Trimen, H.
Medicinal plants. 4 v. London, 1880.

58. Berg, Otto C.
Handbuch der pharmaceutischen botanik. Berlin, 1845. (Later editions).
Pharmazeutische waarenkunde. Berlin, 1852. (Later editions).

59. Berg, O. C. and Schmidt, C. F.
Anatomischer atlas zur pharmaceutischen waarenkunde. Berlin, 1865.
Atlas der officinellen pflanzen. 2 ed. Leipzig, 1891-1902.

60. Bergen, Heinrich von.
Versuch einer monographie der China. Hamburg, 1825.

61. Bergius, P. J.
Materia medica e regno vegetabili. Stockholmiæ, 1778.

62. Berlu, J. J.
The treasury of drugs unlock'd. London, 1690.

63. Berry, Andrew.
Account of the male plant which furnishes the medicines generally called columbo or columba root. (Asiatic researches, x, 1811, p. 385).

64. Berthault, J. M. E.
Du hashisch, son histoire, ses effets physiologiques et thérapeutiques. Paris, 1854.

65. Betiken, L.
De calamo aromatico. Jenæ, 1718.

66. Bidault de Villiers, F. T.
Essai sur les propriétés médicinales de la digitale pourprée. Paris, 1803.

67. Biddle, John B.
Review of materia medica. Phila., 1852.
Materia medica. Phila., 1852. (Later editions).

68. Bierowski, L. J.
Diss. inaug. sistens moschi historiam, naturalem et medicam. Lipsiæ, 1830.

Digitized by Google

69. Bigelów, Jacob.
American medical botany. 3 v. Boston, 1817-20.
Materia medica. Sequel to the pharmacopœia of the United States. Boston, 1822.

70. Biggs, A.
Botanico-medical reference book. Memphis, 1847.

71. Binz, Carl.
Vorlesungen über pharmakologie. Berlin, 1884-6. (Later editions, German and English).

72. Bird, F.
Dissertation on the Sanguinaria canadensis of Linnæus. New York, 1822.

73. Bischoff, G. W.
Medizinisch-pharmaceutische botanik. Erlangen, 1843. Suppl., 1847.

74. Blackett, P. C.
An essay on the use of the Atropa belladonna. London, 1826.

75. Blackwell, Elizabeth.
A curious herbal. 2 v. London, 1737-9.
Herbarium Blackwellianum. 6 v. Norimbergæ, 1750-73.

76. Blagrave, Jos.
Supplement, or enlargement to Nich. Culpeper's English physician. London, 1666. (2 ed. 1677).

77. Blair, Patrick.
Miscellaneous observations in the practice of physick, with remarks on botany. London, 1718.
Pharmaco-botanologia. London, 1723-28.

78. Blankaart, Stephen.
De Nederlandschen herbarius of kruidboek. t'Amsterdam, 1698.

79. Blegny, N. de.
La découverte de l'admirable remède anglois, pour guérison des fièvres. Paris, 1680. (Later editions).

80. Blondel, R.
Les strophanthus du commerce. Paris, 1888. (*Also* Pharm. Jour., xviii, 1888-9, p. 744).

Digitized by Google

81. Bocquillon, H.
Étude botaniques et pharmacologiques des Xanthoxylées. Paris, 1901.
Manuel des plantes medicinales coloniales et exotiques. Paris, 1905.

82. Bock, Hieronymus. (*Known also as* Tragus).
Kreuterbuch. Strassburg, 1539. (Many editions).

83. Bodard, P. H. H.
Cours de botanique médicale comparée. 2 v. Paris, 1810.

84. Boecler, Joh.
Materiæ medicæ cynosuræ continuatio. Argentorati, 1729 (1731).

85. Boerhaave, Hermann.
De materia medica et remediorum formulis. 2 ed. Lugdini-Batavorum. 1727. (Later editions, Latin, French, etc).
Tractatus de viribus medicamentorum. Paris, 1723. (Later editions).

86. Bonavia, E.
Flora of the Assyrian monuments and its outcome. Westminster, 1894.

87. Bontius, Jacob.
De medicina Indorum, libri iv. Lugd. Bat., 1642. (Later editions).

88. Book of the Thousand Nights and a Night; translated from the Arabic by Capt. Sir. R. F. Burton. London, 1894. (Aden edition. London. n. d. Illustrated). Vol. xi, pp. 74-5 and vol. xvii, p. 7.

89. Bosch, H. van den.
De herba Digitali purpurea ejusque usu medico. Trajecti ad Rhenum, 1794.

90. Bossu, A.
Plantes médicinales indigènes. Paris, 1854. (Later editions).

91. Boston Thomsonian Medical Journal. Boston and Providence, 1845-6.

Digitized by Google

92. Botanic Advocate and Journal of Health. Montpelier, Vt., 1836-9.

93. Botanic Medical Reformer and House Physician. Phil., 1840-2.

94. Botanico-Medical Recorder, Columbus, 1837-52.

95. Bouton, Louis.
Medicinal plants—Isle of Mauritius. Mauritius, 1857. (2 ed. 1864. Issued in French and English).

96. Bowker, P. F.
The Indian vegetable family instructor. Boston, 1836.

97. Brandza, D.
Histoire botanique et thérapeutique des Gentianacées employées en médicine. Paris, 1869.

98. Brickenden, J.
De radice scillæ. Edinburgi, 1759.

98a. British Medical Journal. London, 1857-

99. Bronsvick, A.
Les plantes médicinales de la flore française. Epinal, 1872.

100. Brotero, F. A.
Description of Callicocca ipecacuanha. (Trans. Linn. Soc. vi, 1802, pp. 137-40, 1 pl.).

101. Brower, J. V.
On the use of Digitalis purpurea, or purple foxglove in the cure of diseases. New York, 1802.

102. Brown, O. P.
Complète herbalist. Jersey City, 1867. (Later editions).

103. Brown, William.
Pharmacopœia simplicorum & efficaciorum in usum nosocomii militaris ad exercitum Fœderatarum Americæ Civitatum. 2 ed. Phila., 1781. (1st ed. published anonymously in 1778).

104. Browne, J. M.
Indian medicine, *in* Beach, W. W., Indian miscellany. Albany, 1877.

Digitized by Google

105. Bruce, James.
Travels to discover the source of the Nile, 1768-73. 5 v. Edinburgh, 1790. (Later editions).

106. Brunck, F. A.
De coriandro. Argentorati, 1739.

107. Brunfels, Otho.
Herbarum vivæ eicones. Argentorati, 1530. (Numerous editions to 1546).
Iatrion medicamentorum simplicium, continens remedia omnium morborum. 3 v. Argentorati, 1533.

108. Brunton, T. L.
On digitalis, with some observations on the urine. London, 1868.
Pharmacology and therapeutics. London, 1880. (Later editions, English, French, and Italian).

109. Bryarly, W.
Essay on the Lupulus communis of Gærtner; or the common hop. Phila., 1805.

110. Buchan, William.
Domestic medicine, London, 1772. (Many English, American, French, Spanish and Italian editions).

111. Buchanan, Francis.
Account of an Indian remedy for the tapeworm. (Edinburgh Med. and Surg. Journ., 1807, pp. 22-24. (Punica).

111a. Bundy, J. H.
Papers on Eriodictyon and Cascara sagrada. (New Preparations, 1878-9).

112. Burnes, Alexander.
Travels into Bokhara. 2 v. London, 1834.

113. Burton, R. F.
First foot-prints in East Africa. London, 1856.
Lake regions of central Africa. 2 v. London, 1860. (Strophanthus, i, pp. 247, 297; ii, p. 338).

114. Buc'hoz, J. P.
Collection des plantes médicales de la Chine. Paris, 1781.

Digitized by Google

Buc'hoz, J. P.—*Continued.*
Dissertations sur l'utilité, et les bons et manvais effets du tobac, du café, du cacao et du thé. 2 ed. Paris, 1770.
Manuel médical des plantes. 2 v. Paris, 1770.

115. Buchwald, Johannes de.
Specimen medico-practico-botanicum. Havaniæ, 1720.

116. Bulletins of the Lloyd Library. Cincinnati, 1900–

116a. Bulletin of Pharmacy, Parke Davis and Company, Detroit, Michigan. 1887-

117. Burger, J.
Ueber colchicin. Würzburg, 1859.

118. Burwell, L.
Observations on the Digitalis purpurea. Phila., 1805.

119. Cabanes, Augustin.
De l'emploi des préparations d'Hydrastis canadensis en médicine. Paris, 1889.

120. Camerarius, Joachim.
Opuscula quædam de re rustica. Noribergæ, 1577. (2 ed. 1596).
Symbolorum et emblematum ex re herbaria desumtorum centuria. Noribergæ, 1590. (Later editions).

121. Candolle, A. de.
L'origine des plantes cultivées. Paris, 1883. (Later editions in English, Italian and German).

122. Candolle, A. P. de.
Description d'un nouveau genre de plantes, Strophanthus, de la famille des Apocinées. (Ann. Mus. d' Nat. Hist., Paris, i, 1802 (1801), pp. 408-12, 1 pl.).
Essai sur les propriétés médicales des plantes. Paris, 1804. (Later editions, French and German).
Recherches botanico-médicales sur les diverses espèces d'ipécacuanha. (Bull. Fac. de Méd. de Paris, i, 1804, pp. 92-95).

Digitized by Google

123. Cardano, Girolamo.
De radice Cina et Sarza Parilia judicium. Basileæ, 1559.

124. Carminati, Bassiani.
Hygiene, terapeutice et materia medica. (Latin text). 4 v. Papiæ, 1791-5.

125. Carpenter, G. W.
Essays on the materia medica. Phila., 1831.

126. Carpentier, Ad.
Histoire naturelle des Smilacées. Étude des racines de Salsepareille du commerce. Paris, 1869.

127. Carrichter, B.
Kreutterbuch. Strassburg, 1575. (Later editions).

128. Carter, J. M. G.
Synopsis of the medical botany of the United States. St. Louis, 1888.

129. Cartheuser, J. F.
Fundamenta materiæ medicæ tam generalis quam specialis. Francofurti, 1749-50. (Later editions, Latin and French).

130. Catesby, Mark.
The natural history of Carolina, Florida, and the Bahama Islands. London, 1731-43. (Revised ed., London, 1754; 3d ed. 1771. German ed., 1750).

131. Catillon.
Étude pharmacologique de strophanthus. (Bull. et Mém. Soc. de Ther., [2], xiv, 1887, pp. 217-226).

132. Cato, Marcus Porcius.
De re rustica. Venetiis, 1472. (Many editions).

133. Cazaux, P.
Contribution à l'histoire médicale des Strophanthus. Paris, 1887.

134. Cazin, F. J.
Monographie médico-pratique et bibliographique de la Belladonna. Paris, 1856.

135. Cazin, F. J. and H.
Traité pratique et raisonné des plantes médicinales et acclimatées. Paris, 1850. (Later editions).

Digitized by Google

136. Celsus, A. C.
De re medica libri octo. Hagenoœ, 1528. (Later editions).

137. Chambers, J.
Pocket herbal. Bury, 1800.

138. Chambers, Reuben.
Thomsonian practice of medicine. Bethania, Pa., 1842.

139. Chapman, N.
Elements of therapeutics and materia medica. Phila., 1817. (Later editions).

140. Charaka-Samhita: translated by Abinash Chandra Chaviratna. Calcutta, 1890–

141. Charas, Moyse.
Opera, tribus tomis distincta. Genevæ, 1684.
Pharmacopée royale, galénique et chymique. Paris, 1672. (Later editions, French, Latin and English).

142. Chatin, Joannes.
Études sur les Valerianées. Paris, 1872.

143. Chaumeton, F. P. and others.
Flore médicale. 8 v. Paris, 1814-20.

144. Chicago Medical Times. Chicago, 1869-1910.

145. Chiffletius, J. J.
Pulvis febri fugus orbis Americani. Anvers, 1653.

146. Chomel, P. J. B.
Abrégé de l'histoire des plantes usuelles. Paris, 1712. (Later editions).

147. Choulant, J. L.
Handbuch der bücherkunde für die ältere medicin. (Leipzig, 1828. 2 ed. Leipzig, 1841).

148. Chouppe, H.
Recherches thérapeutiques et physiologiques sur l'ipéca. Paris, 1874.

149. Christison, Robert.
Dispensatory. Edinburgh, 1842. (Later editions).
On the properties of the ordeal bean of Old Calabar. (Pharm. Jour. xiv, 1855, p. 470).

Digitized by Google

150. Christy, Thomas.
New commercial plants and drugs. London, 1878-89.

151. Ciezo de Leon, Pedro de.
La cronica del Peru. Sevilla, 1553. (*Also in* Biblioteca de autores espanoles por Enrique de Vedia, v. 26.—*also* translated by Markham in 1864 for the Hakluyt Society).

152. Clapp, Asahel.
Synopsis of the medicinal plants of the U. S. (Trans. Amer. Med. Assoc., v. 1852).

153. Clusius, Carolus.
Aliquot notæ in Garciæ aromatum historiam præter descriptiones peregrinarum nonnullarum stirpium. Antwerpiæ, 1582.
Antidotarium sive de exacta componendorum, miscendorumque medicamentorum ratione. Antwerpiæ, 1561.
Exoticorum libri decem. Antwerpiæ, 1605.
Rariorum aliquot stirpium per Hispanias observatarum historia. Antwerpiæ, 1576.

154. Clutterbuck.
Observations on the nature and preparation of Elaterium. (London Med. Repository, xii, 1819).

155. Coe, Grover.
Concentrated organic medicines. New York, 1858. (Many editions).
Positive medical agents. New York, 1855.

156. Coffin, A. I.
Botanic guide to health. (Many editions, English, American, Welsh).

157. Colborne, Robert.
The plain English dispensatory. London, 1753. (1756).

158. Colladon, T.
Adversaria seu commentarii medicinales critici. Coloniæ Allobrogum, 1615.

Digitized by Google

159. Colladon, L. T. F.
Histoire naturelle et médicale des Casses. Paris, 1816.

160. College Journal of Medical Science. Cincinnati, 1856-9.

161. Collet, R.
Fève de Calabar, histoire naturelle, physiologique, pharmaceutique et toxicologique. Montpellier, 1887.

162. Collin, Eugène.
De rhubarbes. Paris, 1871.

163. Collin, H. J.
Camphoræ vires, sive observationum circa morbos acutos et chronicos factarum, pars tertia. Viennæ, 1773.

164. Comfort, J. W.
Practice of medicine on Thomsonian principles. Phila., 1843. (Many editions).

165. Constantinus, Africanus.
Opera. Basileæ, 1536.

166. Cooper, J. W.
The experienced botanist, or Indian physician. Ebensburg, Pa., 1833. Lancaster, Pa., 1840.

167. Cooper, S.
Dissertation on the properties and effects of the Datura stramonium, or common thornapple. Phila., 1797.

167a. Cooper, Wm.
Preventive Medicine, Cincinnati, 1905.

168. Cordus, E.
Botanologicon. Coloniæ, 1534. (Another edition, Parisiis, 1551).

169. Cordus, Valerius.
Annotationes in Dioscoridis Anazarbei de medica materia libros v. Argentorati, 1561. (First produced in Latin version of Dioscoridis, 1549, *also added to* Botanologicon of E. Cordus, 1551.

Digitized by Google

Cordus, Valerius.—*Continued.*
Dispensatorium Norimbergæ, 1542. (Later editions in Latin, French and Dutch).
Dispensatorium pharmacoporum omnium. Norimbergæ, 1588. (Later editions).
In hoc volumine continentur annotationes in Pedacii Dioscoridis Anazarbei, etc. Argentorati, 1561.

170. Coutinho, S.
Note sur un nouveau médicament, le Jaborandi de Brésil. (Jour. de Thérap. Paris, i, 1874).

170a. Cowley, Abraham.
Poemata latina. Londini, 1662. (2 ed. 1678; English ed., London, 1721).

171. Coxe, J. R.
American dispensatory. Phila., 1806. (Later editions).
Comparative effects of the opium officinarum, extracted from the Papaver somniferum or white poppy of Linnæus, and that procured from the Lactuca sativa or common cultivated lettuce. (Trans. Amer. Phil. Soc. iv, 1799).

172. Crescenzio, Pietro.
Libro della agricultura. Venet., 1511.

173. Cuba, Johannes de.
Ortus sanitatis. (Many editions in different languages from 1485, the first dated copy).

174. Cullen, William.
Lectures on the materia medica. Dublin, 1773. (Later editions, English, French, German and Italian).

175. Culpeper, Nicolas.
Complete herbal. London, 1653. (Many editions).
Pharmacopœia Londinensis. London, 1653. (Later editions).
Physical directory or translation of the London dispensatory. London, 1649.
The English physician enlarged. London, 1653. (Many editions).

Digitized by Google

176. Curtis, Alva.
A fair examination and criticism of all medical systems in vogue. Cin. (Various editions).
Discussions between the regular medical faculty and the Thomsonian botanic physicians. Columbus, 1836.
The provocation and the reply, or allopathy versus physio-medicalism. Cincinnati, 1870.

177. Cushny, A. R.
Pharmacology and therapeutics. Phila., 1899. (Later editions).

178. Cutler, Manasseh.
An account of some of the vegetable productions, naturally growing in this part of America, botanically arranged. (Memoirs, Amer. Acad. of Arts and Sciences, i, 1785. (*Also reprint as* Bulletin Lloyd Library, No. 7).

179. Dale, Samuel.
Pharmacologia seu manductis ad materiam medicam. Londini, 1693. (Later editions).

180. Dale, Thomas.
De Pareira brava et Serapia officinarum. Lugduni-Batavorum, 1723.

181. Dalechamps, Jacques.
Historia generalis plantarum. 2 v. Lugduni, 1587. (French editions, Lyon, 1615, 1653).

182. Daniel, F. W.
On the natives of Old Calabar. (Edinb. New Phil. Jour., 1846, p. 316.) (Physostigma).

183. Danzel, J. F. N.
De lycopodii herba et semine. Gottingæ, 1814.

184. Daries, P. J. A.
De amygdalis et oleo amararum æthereo. Lipsiæ, 1776.
De Atropa belladonna. Lipsiæ, 1776.

185. Datos para la materia medica mexicana. México, 1894-1907.
Descriptions of plants by Dr. J. Ramires, and drugs by Dr. F. Altamirano.

Digitized by Google

186. DeCandolle. *See* Candolle, de.

187. Deininger, C. F. H.
De Atropa belladonna. Berolini, 1833.

188. Delondre, A. and Bouchardat, A.
Quinologie. Paris, 1854.

189. Déniau, P. C. F.
Le silphium (asafœtida). Précéde d'un memoire sur la famille des Ombellifères. Paris, 1869.

189a. Desfontaines, R. L.
Mémoires, Museum d'histoire naturelle, Paris, vii, 1821, p. 378.

189b. Desgranges.
Note sur les propriétés physiques du siegle ergoté. (Jour. Gen. de Med. Chir. et Pharm., Paris, cix, 1829, pp. 26-32).

190. Dictionnaire raisonné-universel de matière médicale. 4 v. Paris, 1773.

191. Dierbach, J. H.
Die arzneimittel des Hippocrates. Heidelberg, 1824.
Die neuesten entdeckungen in der materia medica. 2 ed. 3 v. Heidelberg, 1837-47.
Flora mythologica. Frankfurt, 1833. (French edition, Dijon, 1867).
Synopsis materiæ medicæ. Heidelberg, 1841-2.

192. Dietzius, J. H.
De nuce moschata. Giessæ Hassorum, 1680.

193. Dieu, S.
Traité de matière médicale et de thérapeutique. 4 v. Metz, 1847-53.

194. Dioscorides, Pedanios.
De medica materia libri sex. Venetiis, 1518 (Greek text). (Many editions).
De medica materia libri v. Coloniæ, 1529. (Many editions).
Opera quae extant omnia. Lugduni et Francofurti, 1598. (Many editions).

Digitized by Google

195. Dodoens, Rembert. (Latin Dodonæus).
Cruydeboeck. Tantwerpen, 1554. (Later editions, Latin, Dutch, French and English).
De stirpium historia commentariorum imagines. Antwerpiæ, 1553-4.
Purgantium aliarumque eo facientium tum et radicum Convolvulorum et deleteriarum herbarum historiae libri iv. Antwerpiæ, 1574.
Stirpium historiæ pemptades sex, sive libri xxx. Antwerpiæ, 1583.

195a. Dohme, A. R. L.
Chemical investigations of Rhamnus purshiana.
Contributions to chemical and pharmaceutical publications.

196. Donzelli, G.
Teatro pharmaceutico-dogmatico-spagyrico. Neapoli, 1661. (Later edition).

196a. Dowdeswell, G. F.
Observations on the properties and action of the leaf of the Coca plant, Erythroxylon Coca. (The Lancet, London, 1876, pp. 631, 664).

197. Downey, W.
An investigation of the properties of the Sanguinaria canadensis, or puccoon. Phila., 1803. (*Also, reprint, in* Bulletin Lloyd Library, No. 9).

198. Drake, S. G.
Book of the Indians. Boston, 1837. (Later editions).
Indian captivities or life in the wigwam. Auburn, 1851.

199. Druggists Circular, New York, 1857-

200. Dubois, Fr.
Matière médicale indigène. Tournai, 1848.

201. Du Buysson, H.
Étude historique et botanique de la coca. Lyon, 1892.

Digitized by Google

202. Duncan, Andrew, Jr.
Edinburgh new dispensatory. Edinburgh, 1786. (Later editions in English, German, French and Italian).

203. Dunglison, Robley.
General therapeutics and materia medica. Phila., 1836. (Later editions).
Medical lexicon, dictionary of medical science. Boston, 1833. (Later editions).

204. Dunglison, Robley.
New Remedies. Phila., 1839. (Later editions).

205. Dupau, Jacques.
Observations sur l'usage des végétaux exotiques, et particulierement du gayac, de la squine, de la salsepareille et de la lobelia syphilitica. Paris, 1782.

206. Dupuy, B.
Alcaloides, histoire, propriétés chimiques et physiques, extraction, action physiologique. 2 v. Bruxelles, 1887-8.

207. Dutt, W. A.
Materia medica of the Hindus. Calcutta, 1871. 2 ed. 1877.

208. Dymock, William.
Vegetable materia medica of western India. 2 ed. Bombay, 1885.

209. Dymock, Wm. Warden, G. J. H. and Hooper, D.
Pharmacographia Indica. London, 1890-3.

210. Eastern Medical Journal. Worcester, 1883-1887.

211. Eaton, Amos.
Manual of botany of North America. Albany, 1817. (Later editions).

212. Eberle, John.
Materia medica and therapeutics. Phila., 1822. (Later editions).

213. Ebers, Georg.
Papyrus Ebers. Leipsig, 1889.

Digitized by Google

214. Ebn (Ibn) el Beithar.
De limonibus, tractatus Arabicus in Latinum ab Andrea Bellunensi. Cremonæ, 1757.
Grosse zusammenstellung über der bekannten einfachen heil-und-nahrungsmittel. From the Arabic by Dr. J. v. Sontheimer. 2 v. Stuttgart, 1840-42.

215. Eccard, T. H.
De virtutibus quibusdam Violæ tricoloris, Arnicæ et Asafœtidae. Tubingæ, 1786.

216. Eclectic Medical Gleaner. Cleves and Cincinnati, 1889-1912.

217. Eclectic Medical Journal. Cincinnati, 1849-

218. Eclectic Medical Journal of Pennsylvania. Phila., 1863-1880.

219. Eclectic Medical Journal of Philadelphia, Phila.,1858-1871.

220. Eclectic Review. New York, 1890-1915.

220a. Eclectic National Quarterly, Cincinnati, 1909-

220b. Edinburgh Medical Journal. Edinburgh, 1855-

221. Edrisi or Aldrisi.
Description de l'Afrique et de l'Espagne. Leyde, 1866.
Géographie d'Edresi. 2 v. Paris, 1836-40.

222. Edwards, H. M., and Vavasseur, P.
Manuel de matière médicale, Paris, 1826. (American edition, Phil., 1829).

223. Edwards, J. B.
Notes on the cases of poisoning by calabar beans. (Pharm. Jour. vi, 1864-5, p. 99).

224. Ehrhart, P. J.
De cicuta. Argentorati, 1763.

225. Ehrmann, J. C.
De fœniculo. Argentorati, 1732.

226. Elborne, Wm.
A contribution to the pharmacognosy of Strophanthus. (Pharm. Jour., xvii, 1886-7, p. 743).

Digitized by Google

226a. Ellingwood's Therapeutist, Chicago. 1905-1920.

227. Elliott, Stephen.
Botany of South Carolina and Georgia. Charleston, 1821-4.

228. Emmons, Samuel B.
The vegetable family physician. Boston, 1836.

228a. Ephemeris of materia medica, pharmacy, therepeutics, etc. (Squibb). Brooklyn, 1822.

229. Erichsen, A.
De floribus Arnicæ montanæ. Dorpat, 1857.

230. Ewell, James.
Medical companion, or family physician. Washington, 1822.

231. Faber, A.
On Curaçoa aloes. (Pharm. Jour., vii, 1847, p. 547).

231a. Faber, J. M.
Strychnomania. Augustæ Vindelicorum, 1677.

232. Featherman, A.
Botanical survey of southern and central Louisiana in 1870. New Orleans, 1871.

233. Ferriar, J.
An essay on the medical properties of the Digitalis purpurea, or foxglove. Manchester, 1799.

234. Ficalho, Conde de.
Plantes uteis da Africa portugueza. Lisboa, 1884. (Calumba, p. 87).

235. Fick, J.
Ueber die physiologischen wirkungen des aus dem Spartium scoparium dargestellten spartein. Dorpat, 1873.

236. Fiske, Henry M.
Some of the properties of grindelia robusta. Amer. Jour. Pharm., xlvii, 1875).

237. Fleming, A.
An inquiry into the physiological and medicinal properties of the Aconitum napellus. London, 1845.

Digitized by Google

238. Floyd, John.
Medical properties of Magnolia tripetala and acuminata. Phil., 1806.

239. Flückiger, F. A.
Die chinarinden in pharmakognostischer hinsicht dargestellt. Berlin, 1882. (Eng. ed., London, 1884; Phila., 1884).
Die koloquinthe als nachrpflanze. (Archiv. d. Pharm., cci, 1872, pp. 235-247).
Pharmacognosie des pflanzenreiches. Berlin, 1884. 3d ed. 1891).
Reactionen. Berlin, 1892. (English ed., Detroit, 1893).

240. Flückiger, F. A. and Hanbury, D.
Pharmacographia. London, 1874. (2 ed., London, 1879; French ed., 1878).

241. Folkard, Richard.
Plant lore, legends and lyrics. London, 1884. (2 ed. London, 1892).

242. Fonsagrives, J. B.
Traité de matière médicale. Paris, 1885.

243. Forsten, R.
Cantharidum historiam naturalem, chemicam et medicam exhibens. Lugd. Bat., 1775.

244. Fothergill, John.
Medical observations and inquiries. 2 v. London, 1757.

245. Franceschini, M. A.
Contribution à l'étude de l'action physiologique et thérapeutique de l'aconitine. Paris, 1875.

246. Fraser, Th. R.
On the character, actions, and therapeutic uses of the ordeal bean of Calabar. (Edinb. Med. Jour., lx, 1863-4, p. 123; *also separate*, Edinburgh, 1863).
On the kombe poison. (Jahresb. d. Pharm., 1871, p. 543; 1872, p. 615). (Strophanthus).

Digitized by Google

Fraser, Th. R.—*Continued.*
Strophanthus hispidus, its natural history, chemistry, and pharmacology. (Trans. Roy. Soc. Edin., xxxv, 1890, pp. 955-1027; *also* Pharm. Jour., xix, 1888-9, p. 660; xx, 1889-90, p. 328).
The action and uses of digitalis and its substitutes, with special reference to Strophanthus (hispidus). (Brit. Med. Jour., ii, 1885, pp. 904-911).

246a. Fraude, G.
Method of distinguishing true Quebracho bark from its sophisticants. (Ber. d. Deutsch., Chem. Gas., 1881). (*Also in* New Remedies, June, 1881).

247. Freake, A.
Observations on the Humulus lupulus of Linnæus. London, 1806.

248. Freitag, J.
De opii natura. Groningæ, 1632.

249. Fritschius, P.
De manna. Jenæ, 1677.

250. Frost, H. R.
Syllabus of lectures on the materia medica. Charleston, 1834. (Later editions).

251. Fuchs, Leonhard.
De compositione medicamentorum libri x. Lugduni, 1556.
De historia stirpium commentarii insignes. Basileæ, 1542. (Later editions in Latin, French, German and Dutch).

252. Fuchs, R.
De plantis antea ignotis, nunc studiosorum aliquot neotericorum summa diligenta inventis libellus. Venetiis, 1542.

253. Fuller, Thomas.
Pharmacopœia domestica, or the family dispensatory. London, 1723. (Later editions).
Pharmacopœia extemporanea seu præscriptorum chilias. London, 1710. (Many editions, Latin, German, etc.).

Digitized by Google

254. Fumouze, Armand.
De la cantharide officinale. Paris, 1867.

254a. Galen, Claudius.
Opera omnia. 5 v. Venetiis, 1525. (Later editions).

255. Gallesio, Giorgio.
Traité du citrus. Paris, 1811.

256. Garcin, A. G.
Recherches sur les apocynées étude de botanique et de matière médicale. Lyon, 1889.

256a. Garden, T. S.
On the use of the Actæa racemosa in phthisis pulmonalis. (Amer. Med. Recorder, vi, 1823, pp. 609-613).

257. Gattinger, A.
Medical plants of Tennessee. Nashville, 1894.

257a. Gaubius, H. D.
Adversariorum varii argumentis, liber unus. Leidæ 1771.

258. Geiger, P. L. and Mohr, C. F.
Pharmacopœa universalis. 2 v. Heidelbergæ, 1845.

259. Gelsemium sempervirens. A monograph by the Hughes Medical Club of Massachusetts. Boston and Providence, 1883.

260. Geoffroy, E. F.
Tractatus de materia medica. 7 v. Parisiis, 1741. (Later editions, Latin and French).

261. Georgia Eclectic Medical Journal, Atlanta, 1879-1903.

262. Gerarde, John.
The herbal. London, 1597. (2 ed. by Johnson. London, 1633).

263. Gerrard, A. W.
Strophanthus and strophanthin. (Pharm. Jour. xvii, 1886-7, p. 923).

264. Gesner, Conrad.
Apparatus et delectus simplicium medicamentorum. Lugduni, 1542.

Digitized by Google

Gesner, Conrad.—*Continued.*
Epistolarum medicinalium, libri iii. Tiguri, 1577.
Epistolarum medicinalium, liber iv. Wittebergæ, 1584.

265. Ghioni, G.
Commentariolorum de Hyosciamo. Mediolani, 1792.

266. Girardi, M.
De Uva ursina. Patavii, 1764.

267. Giraud, P. O.
De tamarin et de casse. Montpellier, 1886.

268. Gleditsch, J. G.
Botanica medica. 2 v. Berlin, 1788-89.
De methodo botanica dubio et fallaci virtutum in plantis indice. Francofurti, 1742. (2 ed. Lipsiæ, 1742).

269. Gockelius, C. L.
De Serpentaria Virginiana. Jenæ, 1710.

270. Goebel, F. and Kunze, G.
Pharmaceutische waarenkunde. 2 v. Eisenach, 1827-34.

271. Gomez, B. A.
Memoria sobre Ipecacuanha fusca do Brasil. Lisboa, 1801.

272. Gomez, B. A.
Memoria sobre a virtude tænifuga de romaira. Lisboa, 1822.

273. Good, Peter, P.
Family flora and materia medica botanica. Elizabethtown, 1845-7.

274. Gorter, Joh. de.
Materies medica compendio medicinæ accomodata. Harderovici, 1733.

275. Gough, J. P.
Essay on cantharides. Philadelphia, 1800.

276. Graham, John.
A catalogue of plants growing in Bombay and its vicinity. Bombay, 1839.

Digitized by Google

277. Grandclément, J. M.
De l'ergot de blé. Paris, 1855.

278. Granville, A. B.
The sumbul; a new Asiatic remedy. London, 1850.

279. Graumüller, J. C. F.
Flora pharmaceutica Jenensis. Jenæ, 1815.

280. Graves, George.
Hortus medicus. London, 1833.

281. Gray, S. F.
Supplement to the pharmacopœias. London, 1818. (Later edition).

282. Griffith, R. E.
Medical botany. Phila., 1847.

283. Groenevelt, J. (*or* Greenfield).
De tuto cantharidum in medicina usu interno. London, 1698.

284. Gronovius, J. F.
Diss. camphoræ historiam exhibens. Lugdini Bat., 1715.

285. Grosourdy, Rene de.
El médico botánico criollo. 4 v. Paris, 1864.

286. Guibourt, N. J. B. G.
Histoire abrégée des drogues simples. Paris, 1820. (Later editions).
Histoire naturelle des drogues simples. Paris, 1822. (Later editions).
Mémoire sur les sucs astringents connus sous les noms de cachou, gambir, et kino. Paris, n. d.

287. Guillemot, A.
Sur les propriétés physiologiques et thérapeutiques de l'arnica. Paris, 1874.

288. Gunn, J. C.
Domestic medicine. Phila., 1839. (Later editions).

289. Hagendorn, E.
Tractatus physico-medicus, de catechu, sive terra japonica. Jenæ, 1879.

Digitized by Google

290. Hager, Hermann.
Commentar zur pharmacopœa borussica. Lissa, 1865.
Commentar zur pharmacopœa germanica. Berlin, 1873-4. (1883-4).
Handbuch der pharmaceutischen praxis. Berlin, 1876-8. (Later editions).

291. Hahn, G.
Sur l'aconit. Strasbourg, 1863.

292. Hahnemann, Samuel.
Reine arzneimittellehre. 3 v. Dresden, 1811-21. (Later editions in various languages).

293. Hale, E. M.
Homeopathic materia medica of the new remedies. 2 ed. Detroit, 1867. (Later editions).
Monograph on Gelsemium. Detroit, 1862.
Saw palmetto, history, botany, etc. Phila., 1898.

294. Haller, A. von. *See* Vicat, P. R.
Bibliotheca botanica. 2 v. Londini, 1771-72. (i, p. 12. Epimenides).

295. Haly, Abbas.
Liber totius medicine necessaria. Lugduni, 1523.

296. Hanbury, Daniel.
On an article imported as calumba wood. (Pharm. Jour., x, 1850, p. 321).
Science papers, chiefly pharmacological and botanical. London, 1876.

297. Hancock, J.
The properties and preparations of the Rio Negro sarsaparilla, and of the angustura bark, practically examined. London, 1829.

298. Hand, W. M.
The house surgeon and physician. Hartford, 1818. (Later editions).

299. Handy, H.
Inaugural dissertation on opium. Phila., 1791.

Digitized by Google

300. Harchius, Jodocus.
Enchiridion medicum simplicium pharmacorum. Basiliæ, 1573.

301. Harley, John.
Old vegetable neurotics, hemlock, opium, belladonna, and henbane. London, 1869.

302. Harris, T. M.
The natural history of the Bible. Boston, 1820. (Pomegranate).

303. Hartung, C. A. F. A. H.
De Cinchonæ speciebus, atque medicamentis chinam supplentibus. Argentorati, 1812.

304. Hartwich, C.
Ueber den strophanthus samen. (Archiv. d. Pharm., ccxxvi, 1888, p. 500; *also* ccxxx, 1892, p. 401).

305. Harvey, G.
The conclave of physicians, detecting their intrigues, frauds, and plots against their patients. *Also*, a peculiar discourse of the Jesuits bark, the history thereof, with its true use and abuse. London, 1683.

305a. Hayne, F. G.
Darstellung und beschreibung des arzneigewächse. 14 v. Berlin, 1805-46. (2 ed., 14 v. Leipzig, 1853-56).

306. Heckel, Edouard.
Étude monographique de la famille des Globulariées. Paris, 1894.
Histoire médicale et pharmaceutique des principaux agents médicamentaux. Paris, 1874.

307. Hehn, Victor.
Kulturpflanzen und hausthiere in ihrem übergang aus Asien nach Griechenland und Italian. Berlin, 1870. (Later editions in German, English and Italian).

308. Helbing, H.
Reaction of strophanthin. (Pharm. Jour. xvii, 1886-7, p. 924).

Digitized by Google

309. Helvetius, Adriaan.
Traité des maladies les plus frequentes et des remèdes spécifiques pour les guérir. Paris, 1703. (Later editions).

310. Hempel, C. J.
A treatise on the use of arnica. New York, 1845.

311. Henry, Samuel.
New and complete American family herbal. New York, 1814.

312. Hermann, J.
Cardamomi historiam et vindicias . . . examini submittit. Argentorati, 1762.

313. Hermann, Paul.
Cynosura materiæ medicæ. Argentorati, 1726. (*For continuation see* Boecler, J.

314. Hernandez, Francisco.
Opera quum edita tum inedita. 3 v. Matriti, 1790.
Cuatro libros de la naturaleza y virtudes de la plantas en la Nueva Espana. Mexico, 1615.
Rerum medicarum Novæ Hispaniæ thesaurus. Romæ, 1628. (Later edition, 1651).

314a. Herodotus.
Opera. (Various editions).

315. Herzog, S.
De chamæmelo. Halæ Magd., 1739.

315a. Hesse, O.
Chemical Analyses of Quebracho. (Annal.d.Chemie, ccxi, p. 249; *also in* Proc. Amer. Pharm. Assn. 1882, p. 184).

316. Hildegard, Abbatissa Bingenansis.
De simplicibus medicamentis. Argentorati, 1533.

317. Hill, John.
British herbal. London, 1756.
History of the materia medica. London, 1751.
Useful family herbal. 2 ed. London, 1755. (Later editions).
Virtues of British herbs with their history and figures. London, 1752.

Digitized by Google

317a. Himly, K.
De la paralysis de l'iris, occasionée par une application locale de la belladonna, etc. Paris, 1802.

318. Hirsch, Bruno.
Universal pharmakopöe. 2 v. Leipzig, 1887-90.

318a. Hirschheydt, E. Von.
Ueber die crotonolsäure R. Burchheims. (Arbeiten des Pharmakologischen Institutes Dorpat. iv, 1890, pp. 5-80).

319. Hochstetterus, J. P.
De cinnamomo. Jenæ, 1670.

320. Hoffman, Fr.
Thesaurus pharmaceuticus medicorum. Halæ Saxon, 1675.

321. Hofmann, Caspar.
De medicamentis officinalibus tam simplicibus quam compositis. Parisiis, 1647.

322. Holmes, E. M.
Note on calabar beans. (Pharm. Jour., [3] ix, 1879, p. 913; *also* Amer. Jour. Pharm., 1879, p. 365) (Physostigma).
Note on false strophanthus seeds. (Pharm. Jour., xvii, 1886-7, p. 903).
On the strophanthus seeds of commerce. (Pharm. Jour. xxii, 1892-3, pp. 868 and 927).
Ouabaio arrow poison. (Pharm. Jour., xxiii, 1892-3, p. 965). (Strophanthus).
The arrow poison of the pygmies. (Pharm. Jour., xx, 1890-91, pp. 917 and 927). (Strophanthus).

323. Honnorat, S. J.
Propositions sur l'histoire naturelle, chimique et médicale des cantharides. Paris, 1807.

323a. Hooker, J. D. and Ball, J.
Journal of a tour in Morocco and the Greek Atlas. London, 1878.

324. Hooker, W. J.
Coscinium fenestratum, false calumba root. (Pharm. Jour., xii, 1853, p. 185).

Digitized by Google

325. Hooper, Robert.
Lexicon medicum or medical dictionary. 5th ed. 1825. London. (Various editions).

326. Hornborg, J.
Planta cimicifuga. Upsaliæ, 1774.

327. Horsfield, Thomas.
On the Rhus vernix, radicans and glabrum. (Diss.) Phila., 1792. (2 ed. 1805).

328. Horst, Jakob.
Herbarium Horstianum. Marpurgi, 1630.

329. Howard, Horton.
Improved system of botanic medicine. Columbus, 1832. (Later editions).

330. Huerto, Garcia del.
Coloquios dos simples. Goa, 1563. (Later editions in Latin, Italian and French).

331. Humboldt, A. v.
Essai politique sur le royaume de la Nouvelle Espagne. 5 v. 1811. (Vanilla, ii, p. 338; iii, p. 198).
Reise in die aequinoctialgegenden des neuern continents. 6 v. Stuttgart, 1861-2. (Vanilla, iii, p. 235).

332. Hutten, Ulrich von.
Von der wunderbarliche artzney des holtz Guaiacum genant, und wie man die Frantzosen oder blatteren heilen sol . . . Strasburgh, 1514. (Later ed. in Latin, French and English).

332a. Hygienic Laboratory, Washington, D. C.
Bulletin No. 48. Physiological Standardization of Digitalis.

333. Ibn. *See* Ebn.

333a. Ibn Batuta.
Voyages d'Ibn Batouta. 2 v. Paris, 1853-54.

334. Imbert Gourbeyre, A.
De la mort de Socrate par la ciguë. Paris, 1875.
Histoire de l'aconit. Paris, 1894.

335. Improved American family physician. New York, 1833.

Digitized by Google

336. Irving, R.
Experiments on the red and quill Peruvian bark. Edinburgh, 1785.

336a. Isaac Judæus.
Omnia opera. Lugduni, 1515.

337. Istachri, Abu Ishaq Alfarsi Alistachri.
Buch der Iänder. Hamburg, 1845.

338. Jacquement, É.
Étude des Ipecacuanhas. Lyon, 1888. Paris, 1890.

338a. Jacquin, N. J.
Enumeratio plantarum in insulis Caribæis visinaque Americes continente. Lugduni Batavorum, 1760.
Selectarum stirpium Americanarum historia. Vindobonæ, 1763. (Later editions).

339. James, Robert.
Medicinal dictionary. 3 v. London, 1743-45.
Pharmacopœia universalis, London, 1747. (Later editions).

340. Jeffreys, T.
Remarks on the efficacy of matico as a styptic and astringent. Liverpool, 1844. (Later editions).
Styptic quality of the matico. (London Lancet i, 1839).

341. Joel, Franciscus.
Opera medica. 6 v. Hamburgi, 1616-1631.

342. Johnson, Laurence.
Manual of the medical botany of the United States. New York, 1884.

343. Jones, J.
The mysteries of opium revealed. London, 1700.

344. Jones, L. E. and Scudder, J. M.
American eclectic materia medica and therapeutics. Cincinnati, 1858. (Later editions).

345. Josselyn, John.
New England's rareties discovered in 1672. London, 1672. (Reprint, Boston, 1865).

346. Journal of Materia Medica. New Lebanon, 1859-

Digitized by Google

347. Journal of Rational Medicine. Cincinnati, 1860-62.

348. Justi, C. G.
De Thymelæa mezereo, ejus viribus usuque medico. Marburgi Cattorum, 1798.

349. Kaempfer, Engelbert.
Amœnitatum exoticarum, Lemgoviæ, 1712.

350. Kalm, Pehr.
En resa till Norra America. 3 v. Stockholm, 1753-61. (German ed. 3 v. 1754-64. English, 1770-71, 1772).

351. Kaltschmied, F.
Marathrologia, sive de fœniculo. Jenæ, 1665.

352. Kerner, Arnold.
Balsamus vegetabilis vel sulphuris compositus. Cassel, 1651.

353. Khigge, T.
De mentha piperitide; commentatio botanico-medica. Erlangæ, 1780.

354. Khory, R. N. and Katrak, N. N.
Materia medica of India and their therapeutics. Bombay, 1903.

355. Kiehl, G. F. G.
De Cassiæ speciebus officinalibus. Halæ, 1801.

356. King, John.
American dispensatory. 3 ed. Cincinnati, 1856. 18 ed. (Felter & Lloyd). Cincinnati, 1898-1900. Suppl. (King & Lloyd). Cin. 1880. (Bound with later editions). See No. 357.
American eclectic dispensatory. Cin., 1854.
American family physician. Cin., 1857. (Later editions).

357. King, John, and Newton, R. S.
Eclectic dispensatory of the United States. Cin. 1852. (Title changed to American Dispensatory, 3d edition. See No. 356.)

358. Knapp, M. L.
Dissertation on the properties of the Apocynum cannabinum (Indian hemp). Phila., 1826.

Digitized by Google

359. Köhler, Hermann.
Handbuch der physiologischen therapeutik und materia medica. Göttingen, 1876.

360. Koelie, J. L. C.
De aconito. Erlangæ, 1787.

361. Kost, J.
Domestic medicine. (Thomsonian). Cincinnati, 1851.
Materia medica and therapeutics. Cincinnati, 1849.

361a. Kosteletzky, B. F.
Allgemeine medizinische-pharmazeutische flora. 6 v. Prag. 1831-36.

361b. Kraemer, Henry.
Botany and Pharmacognosy. Philadelphia, 4th ed., 1910.

362. Kransoldus, J. F.
De sabina. Jenæ, 1707.

363. Kremel, A.
Extractum columbo. (Jahresb. d. Pharm. 1887, p. 241).

364. Kunth, K. S.
Anleitung zur kenntniss sämmtlicher in der pharmacopœia borussica aufgeführten officinellen gewächse. Berlin, 1834.

365. Labat, J. B.
Nouveaux voyages aux Isles de l'Amerique. 6 v. Paris, 1722. (Aloes).
Nouvelle relation de l'Afrique occidentale. 5 v. Paris, 1828. (Aloes, iv. pp. 48-65).

366. Laborde, J. V. and Houdé, A.
Le colchique et la colchicine. Paris, 1887.

367. Laborde, J. V. and Duquesnel, H.
Des aconits et de l'aconitine. Paris, 1883.

368. Læt, Joannis de.
Americæ utriusque descriptio novis orbis, seu descriptionis Indiæ occidentalis, libri xviii. Lugd. Bat., 1633. (Sassafras, p. 215).

Digitized by Google

369. Lajoux, H. and Grandval, A.
Médicaments chimiques organiques inscrits au supplement du codex. Paris, 1897.

369a. Lallemand, A.
Sur la composition de l'essence de thym. (Jour. de Pharm. xxiv, 1853, pp. 274-277).

370. La Marche, G. A. de.
De arnicæ veræ usu. Halæ Magdeb., 1719.

371. Lambert, A. B.
An illustration of the genus Cinchona. London, 1821.

371a. Lancet (The). London, 1823-

372. Lane, Levi.
The old Indian practice or botanic family physician. (Gustavus, O.). 1849.

373. Laval, G. H.
Étude sur la scammonée de Montpellier. Montpellier, 1861.

374. Layard, A. H.
Nineveh and its remains. 2 v. New York, 1853.

375. Ledebour, K. F. v.
Flora rossica. 4 v. Stuttgartiæ, 1842-53.

376. Leeuwenhoek, Anton v.
Arcana naturæ. Delphis Batavorum, 1695. (Later editions). (Calumba).

377. Lehamau, P. J. L.
Plantes, remèdes et maladies, ou la médicine simple et facile à la portée de tous. Arras, 1887.

378. Lehmann, J. C.
De balsamo peruviano nigro. Lipsiæ, 1707.

378a. Leibnitz, G. G. de.
De novo antidysenterico Americano magnis successibus comprobato. (Misc. Acad. Nat. Cur., 1695-96, decuria 3, iii [app.] pp. 1-22).

378b. Johannes. (Africanus).
Descrittione dell' Africa. In vol. 1, Ramusio, G. B. Delle navigationi et viaggi. 3 v. Venetiæ,1563-74. (Original in Arabic, Italian translation by the author).

Digitized by Google

379. Le Page du Pratz.
Histoire de la Louisiane. 3 v. Paris, 1758. (Sassafras, ii, p. 36).

380. Leteurtre, A. H.
Documents pour servir à l'histoire du seigle ergoté. Paris, 1871.

381. Lewin, L.
Areca catechu. (Jahresb. d. Pharm., 1891, p. 132).
Die afrikanischen pfellgifte. Berlin, 1894.
Ueber Areca catechu, Chavica betle und das betelkauen, Stuttgart, 1889.

381a. Lewis, M. and Clarke, W.
Travels to the source of the Missouri river and across the American continent in 1805-6. 3 v. London, 1815. (2 v. Phila., 1814; 2 v. New York, 1894).

382. Lewis, W.
An experimental history of materia medica. London, 1761. (Later editions).

382a. Lewton, Frederick L.
Different species of quebracho. (Proc. Amer. Pharm. Assn., 1899, p. 378).

383. Ligon, Richard.
True history of Barbadoes. London, 1657. (Aloes, p. 98).

384. Lindley, John.
Flora medica. London, 1838.
Medical and œconomical botany. London, 1849. (Later edition).

385. Linnæus, Carl.
Amœnitates academicæ. 7 v. Holmiæ, 1749-79. (3 ed. 10 v. Erlangæ, 1787-1790).
Species plantarum, 4 ed. (Willdenow), Berolini, 1797-1833.

386. Litsauer, C.
De cortice chinæ historice, chemice et pharmacologice considerato. Budæ, 1824.

Digitized by Google

387. Livingstone, David.
Missionary travels and researches in South Africa. London, 1857. (Many editions).

388. Lloyd, J. U.
In each of these (388) studies great credit is due to Dr. Sigmund Waldbott, who made all the translations from foreign prints and devoted much time to the work.
Aloe succotrina. (Western Druggist, xx, 1898. 338-342).
Areca catechu. (Western Druggist, xx, 1898, pp. 195-198.)
Cephælis ipecacuanha. (West. Drug., xx, 1897, 346-350).
Citrullus colocynthis. (West. Drug., xix, 1898, 243-246).
Copaifera officinalis. (West Drug., xx, 1898, 54-57).
Croton tiglium. (West. Drug., xx, 1898, 151-154).
Historical story of sassafras. (West. Drug., xx, 1898, pp. 484-489).
Hydrastis canadensis. (West. Drug., xix, 1897, 59-60).
Jateorhiza calumba. (West. Drug., xx, 1898, pp. 8-11).
Opium. (Ecl. Med. Gleaner, n. s., iii, 1907, 409-425).
Physostigma venenosum (Calabar). (West. Drug., xix, 1897, pp. 249-251).
Punica granatum. (West. Drug., xix, 1897, p. 202-205).
Strophanthus hispidus. (West. Drug., 1897, p. 403-406).
Strychnos nux vomica. (West. Drug., 1897, pp. 109-110).
Vanilla planifolia. (West. Drug., 1897, pp. 548-554).
Veratrum viride. (West Drug., 1897, pp. 447-449).

388a. Lloyd Library. Bulletin No. 12. The eclectic alkaloids.

Digitized by Google

388b. Lloyd Library. Bulletin No. 11. Samuel Thomson and a History of the Thomsonian materia medica. Cin., 1909.

388c. Lloyd Bros. Drug Treatise No. 22. On opium and its compounds. Cin., 1908.

388d. Lloyd Bros. Drug Treatise No. 16. On Scutellaria. Cin., 1908.

389. Lloyd, J. U. and C. G.
Drugs and Medicines of North America, 2 v. Cin., 1884-5.

390. Lobelia Advocate and Thomsonian Medical Recorder. Westminster and Baltimore, 1838-9.

391. Lochner, M. P.
Schediasma de Pareira brava, novo americano calculi remedio. Norimbergæ, 1712(?) (2 ed. 1719).

392. Loiseleur-Deslongchamps, J. L. A.
Recherches et observations sur l'emploi de plusieurs plantes de France—de la médicine. Paris, 1819.

393. Long, S. H.
Account of an expedition from Pittsburgh to the Rocky Mountains, 1819-20, compiled by Edwin James. 2 v. Phila., 1823.

394. Lonitzer, Adam. (Lonicerus).
Kreuterbuch. Frankfurt-am-M., 1557. (Many editions to 1783).

395. Luerssen, C.
Pflanzen der pharmacopœa germanica. Leipzig, 1883.

395a. Lyon, A. B.
Manual of Pharmaceutical Assaying. Detroit, 1886.

396. Macasius, J. C.
Promptiarium materiæ medicæ. Lipsiæ, 1677.

397. Macer Floridus (Aemilius).
De viribus herbarum. Neapoli, 1487. (Later editions in Latin, English and French).

398. McEwen, P.
The pharmacognosy and chemistry of calabar bean. (Pharm. Jour. (3) xvii, 1887, p. 641).

Digitized by Google

399. Maclagan, J. McG.
On the natural history, physiological actions and therapeutic uses of Colchicum autumnale. Edinburgh, 1852.

399a. Madanavinoda (Madana-Pala-Nighantu). Composed A. D. 1374. Calcutta, 1875.

400. Magnenus, J. C.
De manna. Papiæ, 1648.

401. Maine Medical Journal, Lewiston, 1882-3.

401a. Maisch, John M.
A voluminous writer on subjects pertaining to chemistry and pharmacy. For thirty years editor of the American Journal of Pharmacy.

402. Mangold, J. C.
Materiæ medicæ, idea nova tripartita. Basileæ, 1715.

403. Manns, V.
Das Santonin, eine pharmacologische monographie. Marburg, 1858.

404. Marcellus ("Empiricus").
De medicamentis empiricis physicis et rationalibus. Basileæ, 1536.

405. Marchand, L.
Enumeration des substances fournées à la médicine et à la pharmacie par l'ancien groupe des térébinthacées. Paris, 1869.

406. Markham, C. R.
Botanical descriptions of the species of Cinchona. London, 1861.
Cinchona species of New Granada. London, 1867.
Peruvian bark: Popular account of introduction into India. London, 1880.
Travels in Peru and India while collecting Cinchona plants. London, 1862.

407. Marquis, A. L.
Sur l'histoire naturelle et médicale des gentianes. Paris, 1810.

Digitized by Google

408. Martin, Hugh.
Account of the principal dyes employed by the North American Indians. (Trans. American Phil. Soc., 1793).

409. Martius, C. F. Ph. de, and others.
Flora Brasiliensis. 15 v. in 40. München u. Leipzig, 1840-1906.

410. Martius, G.
Pharmakolokisch-medicinische studien über den hanf. Erlangen, 1855.

410a. Martius, T. W. C.
Pharmakognosie des pflanzenreiches. Erlangen, 1832.

411. Massachusetts Medical Journal. Boston, 1881.

412. Massie, T.
An experimental enquiry into the properties of the Polygala Senega. Phila., 1803.

413. Masudi, Abn-l-Hasan.
Ancient accounts of India and China by two Mohammedan travelers in the 9th century. Trans. by E. Renaudot. London, 1730.
Les prairies d'or. Paris, 1869.

414. Matthioli, P. (Latin, Matthiolus).
Epistolarum medicinalium libri quinque. Pragæ, 1561. (Lugduni, 1564).
Opera quæ existant omnia. Basileæ, 1598. (2 ed. not different. 1674).
Opusculum de simplicium medicamentorum facultatibus secundum locos et genera. Venetiis, 1569. (Lugduni, 1571).
Pedacii Dioscoridis de materia medica libri sex. Venetiis, 1554. (Later editions in Latin, German, French, Italian and Bohemian).

415. Mattson, Morris.
American vegetable practice. Boston, 1841.

416. Mayne, John.
A dispensatory and therapeutical remembrancer. Amer. ed. Phila., 1848.

Digitized by Google

417. Medical Brief. Wilson, N. C. St. Louis, 1873-

418. Medical Gleaner. *Title of vol. 1 of* Eclectic Medical Gleaner.

418a. Medical Record. New York, 1866-

418b. Medical Repository, New York, 1797-1824.

419. Medical Tribune. New York, 1878-95.

420. Mel, F. P.
Diss. mel saccharo præstantius declarans. Altdorfi Noric., 1724.

421. Mellin, C. J.
Praktische materia medica. 2 ed. Altenburg, 1778. (Later editions).

422. Mérat, F. V. and Lens, A. J. de.
Dictionnaire universel de matière médicale. 7 v. Paris, 1829-46.

423. Mercer, John.
Adulteration of powdered ipecacuanha. (Pharm. Jour., [3] iv, 1874).

424. Merck, E.
Strophanthus and strophantin. (Pharm. Jour. xviii, 1887-8, p. 72).

425. Mesua, or Mesue, J.
Venetiis, 1558. (Many editions).

426. Meyer, Arthur.
Psychotria ipecacuanha. (Archiv. d. Pharm., ccxxi, 1883, pp. 721-745).

427. Meyer, E. H. F.
Geschichte der botanik. 4 v. Königsberg, 1854-7.

428. Meyer, J. A.
De rubo idæo officinarum. Halæ Magdeb., 1744.

429. Meyer, L.
De Fucho crispo seu lichene carrageno. Berolini, 1835.

430. Meyrick, William.
New family herbal. Birmingham, 1790.

Digitized by Google

431. Michælis, A. A.
Arnica montana nebst Calendula und Hypericum als heilpflanze. München, 1895.
Belladonna, Atropa belladonna als heilpflanze. Berlin, 1897.
Bryonia alba als heilpflanze. Hildburghausen, 1900.
Der kaffee, Coffea arabica als genuss und heilmittel. Erlangen, 1893.
Pulsatilla, (Anemone, osterblume) als heilpflanze. Hildburghausen, 1900.

432. Michaux, Andre.
Journal of travels into Kentucky, 1793-96. (From the original French in the Proc. Amer. Phil. Soc., 1889, pp. 1-145). (Early western travels, iii, pp. 1-104. Cleveland, 1904).

433. Michaux, F. A.
Flora boreali-americana. 2 v. Paris, 1803. (2 ed. Paris, 1820).
Travels to the west of the Alleghany Mountains, 1801-03. London, 1805. (Early western travels, iii, pp. 109-306. Cleveland, 1904).

434. Middle States Medical Reformer and Advocate of Innocuous Medication. Millville and Bloomsburg, Pa., 1854-8.

435. Midy, L.
Essential oil of Sandal, ol. santal flav. pur. Its history, preparation, and properties. Paris, 1887.

436. Miller, Joseph.
Botanicum officinale, or compendius herbal. London, 1722.

437. Miller, P.
Abridgement, Gardeners' dictionary. 5 ed. London, 1763. (Punica).

438. Millot, D. B. J. L.
Histoire pharmacologique du camphre. Strasbourg, 1837.

439. Mills, F. W.
Marrow of practical medicine. St. Clairsville, O., 1848.

Digitized by Google

440. Millspaugh, C. F.
American medicinal plants. 2 v. Phila., 1887.

441. Mitchell, John S.
On the Arbutus uva ursi and Pyrola umbellata and maculata of Linnæus. Phila., 1803.

442. Mizauld, Antonine.
Opusculum de sena, planta inter omnes quotquot sunt, hominibus beneficentissima et saluberrima. Parisiis, 1607.

443. Mizauld, Antoine.
Alexikepus seu auxiliaris hortus. Lutetiæ, 1565. (German ed. Basel, 1576).

444. Molina, G. I.
Saggio sulla storia naturale del Chile, Bologna, 1782. (Later ed. in French, German, Spanish and English).

445. Molkenbœr, J. H.
De colocynthide. Lugd. Bat., 1840.

446. Mollière, H.
Un mot d'historique sur l'ipéca. Lyon, 1889.

447. Monardes, Nicholas.
Historia medicinal de Indias occidentales. Sevilla, 1569. (Later ed. in Spanish, Latin, English, French and Italian).

448. Monroe, John.
The American botanist and family physician. Wheelock, Vt., 1824.

448a. Montreal Pharm. Jour., Montreal, Canada, 1890-

449. Moore, Francis.
Travels into the inland parts of Africa. London, 1737.

450. Moore, J.
On digitalis purpurea or foxglove, and its use in some diseases. Phila., 1800. (*Also*, Phila., 1805).

451. Morris, C.
On the Prunus virginiana, commonly known in the United States by the name of the wild cherry tree. Phila., 1802.

Digitized by Google

451a. Mortimer, W. G.
Peru, History of Coca, "The divine plant of the Incas." New York, 1901.

451b. Motherby, George.
A new medical dictionary. London, 1775. (Later editions).

451c. Mouffett, Thomas.
Insectorum sive minimorum animalium theatrum. Londini, 1634. (English ed., London, 1638).

452. Müller, F. von.
Eucalyptographia. Melbourne, 1879-84.

453. Münch, B. F.
Practische abhandlung von der Belladonna. Göttingen, 1785.

454. Münch, J. H.
Diss. circa usum Belladonnæ in melancholia, mania et epilepsia. Göttingæ, 1783.

455. Munting, Abraham.
De vera antiquorum Britannica. Amstelodami, 1681.

456. Muralt, Johann von.
Physicæ specialis. Tiguri, 1710.

457. Murillo, Adolphe.
Plantes médicinales du Chili. Paris, 1890.

458. Murray, J. A.
Apparatus medicaminum. 6 v. Göttingæ, 1776-92. (Later Editions).
Commentatio de Arbuto uva ursi. Göttingæ, 1765.

459. Murray, John.
Elements of materia medica and pharmacy. 2 v. Edinburgh, 1804. (Later editions).

460. Mynsicht, Hadrianus von.
Thesaurus et armanmentarium medico-chymicum. Lugduni, 1670.

460a. Nadkarni, K. M.
Indian plants and drugs, with their medical properties and uses. Madras, 1908.

Digitized by Google

461. Neale, A.
Researches respecting the natural history, chemical analysis and medicinal virtues of the spur, or ergot of rye. London, 1828.

462. Nees von Esenbeck, T. F. L.
Plantæ medicinales oder sammlung offizineller pflanzen. Düsseldorf, 1821-33.

463. Neligan, J. M.
Medicines, their uses and mode of administration. Dublin, 1844. (Later editions).

464. Newberry, Percy E.
Notes on the history of medicine in ancient Egypt. (Pharm. Jour. and Trans. xix, 1888-9, p. 408). (Punica).

465. New England Botanic Medical and Surgical Journal. Worcester, 1847-51.

466. New Jersey Eclectic Medical and Surgical Journal. Newark, 1874-6.

467. New Preparations. Detroit, 1877-79. (Continued as Therapeutic Gazette).

467a. New Remedies. New York, 1872-1883. (Continued as American Druggist).

468. New York Eclectic Medical and Surgical Journal. Syracuse and Rochester, 1849-52.

469. New York Eclectic Medical and Surgical Journal. New York, 1877-80.

470. New York Medical and Surgical Journal. New York, 1880-81.

471. Nicolai, E. A.
Systema materiæ medicæ ad praxin applicatæ. 2 v. Halæ Magdeburgicæ, 1751-2.

472. Nicolaus Præpositus.
Incipit antidotarium. Venitiis, 1471.
Dispensarium ad aromatorios. Lugduni, 1505. (Lugd. 1537).

Digitized by Google

473. Nicolini, H.
Historiques des pilocarpus. Étude botanique, pharmacologique et chimique, physiologique et thérapeutique du Philocarpus pennatifolius. Montpellier, 1876.

474. Niess, J.
A short treatise on the use of arnica. Canton, O., 1851.

475. Nothnagel, H. (and Rossbach, M. J.).
Handbuch der arzneimittellehre. Berlin, 1870. (Later editions).

476. Nourij, F. G.
Diss. exhibens historiam botanicam, chemico-pharmaceuticam et medicam foliorum Diosmæ serratifoliæ (vulgo foliorum buchu). Groningæ, 1827.

477. Nuttall, Thomas.
Journal of travels into the Arkansas territory, 1819. Phila., 1821.

478. Nylandt, Petrus.
Der nederlandste herbarius of kruydtboeck. Amsterdam, 1670. (Later editions).

479. Occo, Adolph.
Pharmacopœa s. medicamentarium pro republica Augustana. Aug. Vind. 1564. (Later editions).

479a. Oribasius, D.
Oeuvres d'Oribase. 6 v. Paris, 1851-76.

480. Orta, Garcia. (Latin Ab Horto). *See* Huerto, Garcia del.

481. Ortega, C. G.
De Cicuta commentarius. Matriti, 1763. (Spanish ed. Madrid, 1763).

482. Ortus sanitatis. *See* Cuba, Johannes de.

483. Osborne, Henry S.
Plants of the Holy Land. Phila., 1861.

484. O'Shaughnessy, W. B.
Bengal dispensatory and pharmacopœia. Calcutta, 1841.

Digitized by Google

485. Ott, I.
Cocain, Veratria and Gelsemium. Toxicological studies. Phila., 1874.

486. Oudemans, C. A. J. A.
Aanteekeningen op het systematisch . . . en pharmacognostisch-botanische gedeelte der pharmacopœa neerlandica. Rotterdam, 1854-56.

487. Oviedo y Valdes, G. F. de.
Historia natural y general de las Indias. Sevilla, 1535. (Later editions).

488. Pagenstecher, F.
Ueber Linum catharticum L. München, 1845.

489. Paine, Martin.
Materia medica and therapeutics. New York, 1848. (Later editions).

490. Paine, William.
Epitome of the eclectic practice of medicine. Phila., 1857. (Later editions).
Medical properties and uses of concentrated medicines. Phila., 1865.
New school remedies and their application. Phila., 1874.

491. Paris, J. A.
Pharmacologia. 2 ed. London, 1812. (Later editions).

492. Parkinson, John.
Theatrum botanicum. London, 1640. (Later ed. London, 1755).

493. Paulli, Simon.
Quadripartium botanicum de simplicium medicamentorum facultatibus. Rostochii, 1640. (Argentorati, 1667. Francofurti, 1708).

494. Paulus, Aegineta.
Pauli Aeginetæ libri septem. Venetiis, 1528. (Numerous editions).

495. Pax, F.
Ueber die stammpflanze der strophanthus samen. (Engler's Jahrbücher, 1892, pp. 362-386).

Digitized by Google

496. Pearson, Richard.
Practical synopsis of the materia alimentaria and materia medica. London, 1807.

497. (Pechey, G.)
Some observations made upon the Calumba wood. otherwise called Calumbach, imported from the Indies. London, 1694.

498. Pierce, J. B.
On Smyrna opium. Baltimore, 1868.

498a. Penzoldt, F.
Physiological investigations on quebracho. (Proc. Amer. Pharm. Assn., 1880, p. 138).

499. Percival, T.
Observations and experiments on the Colombo root. *In his* Works. London, 1807, iii, 263-284.

500. Percy, S. R.
Physiological and medicinal properties of Veratrum viride. (Trans. Amer. Med. Assoc., xvii, 1864).

501. Pereira, Jonathan.
Materia medica and therapeutics. London, 1839. (Later editions).

502. Pfaff, C. H.
System der materia medica. 7 v. Leipzig, 1808-24.

503. Pharmacopœia of the Massachusetts Med. Soc., Boston, 1808.

504. Pharmacopœias of the different countries and cities.

505. Philadelphia Botanic Sentinel and Thomsonian Medical Revolutionist. Phila., 1839-44.

506. Phillips, C. D. F.
Materia medica and therapeutics. (Vegetable kingdom). London, 1874. (Later editions).

507. Physicians of Myddvai; Meddygon Myddfai, or the medical practice of the celebrated Rhiwallon and his sons. London, 1861. See also *Aconite*, Footnote (Text).

508. Physio-medical Journal. Indianapolis, 1877.

509. Physio-medical Journal and Reform Advocate. Indianapolis, 1875-6.

Digitized by Google

510. Pickering, Charles.
Chronological history of plants. Boston, 1879.

511. Piso, Guilelmus.
De Indiæ utriusque re naturali et medica. Amstelædami, 1658.
De medicina Brasiliensi libri iv, et Georgii Marcgravii historiae rerum naturalium Brasiliæ libri viii. Antwerpianus, 1648.
Historia medica Brasiliæ. Vindobonæ, 1817. (Part I of historia naturalis. 1648).
Historia naturalis Brasiliæ. Lugduni-Batavorum, 1648.

512. Planchon, L.
Produits fournis à la matière médicale par la famille des apocynées. Montpellier, 1894.

513. Platearius, Matthæus.
De simplici medicina. (Circa instans, *in* Nicolaus Præpositus, Dispensatorium, etc., Lugduni, 1537).

514. Plinius, Cajus Secundus. (Pliny).
Historia naturalis, libri xxxvii. 1 ed. Venetiis, 1469. (Many editions in different languages).

514a. Plukenet, Leonard.
Opera omnia. Londini, 1720. (Later editions).

515. Plumier, Charles.
Description des plantes de l'Amérique. Paris, 1693.
Plantarum americanum. Amstelodami, 1755-60.

516. Poerner, C. W.
Selectus materiæ medicæ. Lipsiæ. 1767.

517. Poll, Nicolaus.
De cura morbi gallici per lignum guaycanum libellus. Venetiis, 1535.

518. Polo, Marco.
Travels. (Various editions).

519. Pomet, Pierre.
Histoire générale des drogues simples et composes. Paris, 1694. (Later editions in French and English).

Digitized by Google

520. Porcher, F. P.
Medicinal and toxicological properties of the cryptogamic plants of the United States. (Trans. Amer. Med. Assoc., vii, 1854).
Report on the indigenous medicinal plants of South Carolina. (Trans. Amer. Med. Assoc., ii, 1849).
Resources of the southern fields and forests. Charleston, 1863. (New edition, 1869).

521. Pott, C. W.
De camphoræ circumspecto usu medico. Halæ Magd., 1722.

522. Potter, S. O. L.
Materia medica, pharmacy and therapeutics. Phila., 1887. (Later editions).

523. Pouchet, F. A.
Histoire naturelle et médicale de la famille des Solanées. Paris, 1829.

524. Poughkeepsie Thomsonian. Poughkeepsie, 1838-47.

525. Poujade, M.
Les cassiées purgatives en général et des sénés en particulier. Montpellier, 1890.

526. Priest, Michael L.
Medical companion. Exeter, 1838.

527. Purchas, Samuel.
His pilgrimes. 5 v. London, 1625-26.

528. Pursh, F. T.
Flora Americæ septentrionalis. 2 v. London, 1814. (Reprint, London, 1816).

529. Quekett, E. J.
Observations . . . the ergot of rye and some other grasses. (Trans. Linn. Soc., xviii, 1841 [read 1838] xix, 1845 [read 1842]).

530. Quercetanus, Jos.
Pharmacopœia dogmaticorum. Paris, 1603. (Later editions).

531. Quevenne, T. A.
Examimem chimique de la racine du polygala de Virginie. Paris, 1836.

Digitized by Google

532. Quincy, John.
Lexicon physico-medicum, or a new physical dictionary. London, 1719. (Later editions).

533. Racord, J.
De la racine de colombo. Paris, 1875.

534. Radius, J.
De Pyrola et Chimophilia. Lipsiæ, 1829.

535. Rafinesque, C. S.
Medical flora: or medical botany of the U. S. 2 v. Phila., 1828-30.

536. Ray, John.
Historia plantarum. 3 v. Londini, 1686-1704.

537. Reber, B.
Le genre Strophanthus et ses qualités thérapeutiques. (Le Progrés, Geneve, iii, 1887, pp. 277, 293, 313.)

538. Redi, Francesco.
Esperienze intornó a diverse cose naturali e particularmente a quelle che ci son portate dell' India. Firenze, 1671.

539. Redwood, Theophilus.
Supplement to the pharmacopœia. London, 1847. (Later editions).

540. Reece, Richard.
Medical and chirurgical pharmacopœia. Bristol and London, 1800.
Practical observations on the radix rhataniæ or rhatany root. London, 1808.

541. Reich.
Die ipecacuanha. Jena, 1863.

542. Reid, Hugo.
Outlines of medical botany. Edinburgh, 1832.

543. Reil, Wilh.
Monographie des aconit. Leipzig, 1858. (Amer. ed. New York, 1860).

544. Reinhold, S. A.
De Aconito napello. Argentorati, 1769.

Digitized by Google

544a. Remington, J. P.
Associate Editor, U. S. Dispensatory, 1883.
Practice of Pharmacy, Phila., 1885. (4 ed. 1905).

545. Rennie, James.
A new supplement to the pharmacopœias. London, 1827. (Later editions).

546. Reuss, D. C. F.
Dispensatorium universale. Argentorati, 1786. (Later editions).

547. Rheede tot Draakestein, H. A. van.
Hortus indicus malabaricus. 12 v. Amstelodami, 1678-1703.

548. Rhein, J. C.
De cardamomis. Jenæ, 1704.

548a. Rice, Charles.
Chairman of the Committee of Revision of the U. S. P., 1880, 1890, 1900.
Contributor to all literature, scientific and otherwise, touching pharmacy, chemistry, materia medica and allied subjects.

549. Ricettario di dottori dei arte e di medicina del collegio Fiorentino. Firenze, 1498. (Many later editions).

550. Richard, Achille.
Botanique médicale. Paris, 1823. (German ed. Berlin, 1824-6).
Histoire naturelle et médicale des differentes especes d'ipécacuanha du commerce. Paris, 1820.

551. Richter, J. G.
De squilla. Halæ Magdeb., 1722.

552. Rimmel, Eugene.
Book of perfumes. 4 ed. London, 1865. (Later editions).

553. Robinson, Matthew.
New family herbal. Wakefield, (1863).

554. Rochette, P.
Recherches sur le colchique d'automne. Paris, 1876.

Digitized by Google

555. Roques, Joseph.
Phytographia médicale. 2 v. Paris, 1821. (Later editions).

556. Rosenthal, D. A.
Synopsis plantarum diaphoricarum. Erlangen, 1862.

557. Rosslin, E.
Kreuterbüch. Franckenfurt am Meyn, 1540.

558. Roussel, H. F. A. de.
Tableau des plantes usuelles. Caen, 1792.

559. Roxburgh, W.
Flora Indica. Vol. I. reprint 1874, p. 402. (Punica).

560. Royle, J. F.
Materia medica and therapeutics. London, 1847. (Later editions).

561. Ruel, Jean. (Ruellius).
De natura stirpium. Parisiis, 1536. (Later editions).

561a. Rufus Ephesius.
Oeuvres de. Paris, 1879. (French edition).

562. Ruiz, H.
Quinologia. Madrid, 1792. Suppl. 1801 (German and Italian editions).

563. Ruiz, H. and Pavon, J.
Flora Peruviana et Chilensis. 4 v. Matriti, 1798-1802.

564. Rusby, H. H.
Coca at home and abroad. (Therapeutic Gazette [3 s] iv, 1888, pp. 158-165; 303-307).
On Guarana. (Amer. Jour. Pharmacy, lx, 1888).

565. Ruschenberger, W. S. W.
Report on the origin and therapeutic properties of Condurango. Washington, 1873.

566. Russell, Alexander.
The natural history of Aleppo. London, 1756. (Later editions, English and German).

567. Rutty, Johanne.
Materia medica antiqua & nova. Londini, 1775.

Digitized by Google

568. St. Louis Eclectic Medical Journal. St. Louis, 1874-83.

569. St. Louis Medical Journal. St. Louis, 1884-

570. Saladinus, Asculanus.
Compendium aromatariorum. Bonon., 1488.

570a. Salmon, William.
Doron medicum a supplement to the new London dispensatory. London, 1683.

571. Sanborn, P. E.
The sick man's friend. Taunton, 1835.

572. Sangiorgio, Paolo.
Istoria delle plante medicale. 4 v. Milano, 1809-10.

573. Sansovino, F.
Della materia medicinale libri quattro. Venetia, 1562.

574. Sawyer, J. C.
Odorographia. 2 v. London, 1892-4.

575. Scheferus, J. D.
De chamomilla. Argentorati, 1700.

576. Schillemans, G. J.
De balsamo peruviano nigro. Lugduni-Bat. 1845.

577. Schleiden, M. J.
Handbuch der medinisch-pharmaceutischen botanik. 2 v. Leipzig, 1852-7.

578. Schmaus, Leonard.
Lucubratiuncula de morbo gallico et cura ejus noviter reperta cum ligno indico. Augustæ Vindelicorum, 1518.

579. Schmid, J. A.
De glycyrrhiza. Jenæ, 1717.

580. Schmid, J. U.
De gialape. Jenæ, 1678.

581. Schneider, O.
Nicandrea. Lipsiæ, 1856.

582. Schœpf, J. D.
Materia medica Americana, potissimum regni vegetabilis. Erlangæ, 1787. *Also reprint*, Bull. Lloyd Library, No. 6.

Digitized by Google

583. Schroeckius, L.
Historia moschi. Augustæ Vindelicorum, 1682.

584. Schroeder, F. J. W.
De taraxico. Erlangæ, 1754.

585. Schröder, Jon.
Pharmacopœia medico-chymica. Ulmæ, 1641. (Later editions).
Pharmacopœia universalis. Nürnberg, 1746-48.
Vollständige und nutzreiche apotheke. Nürnberg, 1693.

586. Schroff, C. v. Jr.
Beitrag zur kenntniss des aconit. Wien, 1871.

587. Schumacher, G. H.
De Arnica montana. Berolini, 1836.

588. Schwilgue, C. J. A.
Traité de matière médicale. 2 v. Paris, 1805. (Later editions).

588a. Scott, Joannes.
De plantis medicinalibus in insula Ceylona nascentibus. Edinburgi, 1819.

589. Scribonius, Largus.
De compositionibus medicamentorum. Parisiis, 1528. (Later editions, 1529, 1655).

590. Scudder, J. M.
Various works.

591. Seidler, P.
Ueber Chrysarobin und die angebliche Chrysophansäure im Goa pulver. Göttingen, 1878.

592. Semmedo, J. C.
Pugillus rerum Indicarum, etc. Vitembergæ, 1722. (Calumba, p. 32).

593. Semmer, C.
Disquisitiones pharmacologicæ de Asafœtida et Galbano. Dorpat, 1859.

594. Seueberlich, F. G.
De quinta essentia regni vegetabilis, sive de melle, vom Honig. Erfordiæ, 1726.

Digitized by Google

595. Shoemaker, J. V.
Materia medica, pharmacology and therapeutics. 2 v. Phila., 1889. (Later editions).

596. Short, Thomas.
Medicina Britannica, 2 ed. London, 1747.

597. Shultz, Benjamin.
Botanico-medical dissertation on the Phytolacca decandra. Phila., 1795.

598. Sigmund, Benjamin.
De Colchici autumnalis efficacia et uso medico. Basiliæ, 1830.

599. Simmonds, P. L.
Commercial products of the vegetable kingdom, London, 1854.
On betel leaf oil. (Jahresb. d. Pharm., 1892, p. 27).

600. Slevogt, J. H.
De momordica. Jenæ, 1719.
De pyrethro. Jenæ, 1709.

601. Smith, Elisha.
Botanic physician. New York, 1830. (Revised ed. New York, 1844).

602. Smith, F. P.
Contributions towards the materia medica and natural history of China. London, 1871.

603. Smith, John.
Dictionary of popular names of plants. London, 1882.

604. Smith, Joseph.
The dogmaticus or family physician. Rochester, N. Y., 1829.

605. Smith, Peter. The Indian Doctor's Dispensatory. Cincinnati, 1813. (*Also, reprint*, Bulletin Lloyd Library, No. 2).

605a. Smith, Porter.
Materia medica and natural history of China. 1871.

Digitized by Google

606. Spalding, L.
History of the introduction and use of Scutellaria lateriflora (skullcap) as a remedy for . . . hydrophobia. New York, 1819.

607. Speidel, R.
Beiträge zur kenntnis des bitterstoffs von Citrullus colocynthis. Stuttgart, 1894.

608. Sperry, I. J.
Family medical adviser. Hartford, 1847.

609. Sperry, L.
Botanic family physician. Cornwall, Vt. 1843.

610. Spix, J. B. v. and Martius, K. F. P. v.
Reise in Brasilien. 3 v. München, 1823-31.

610a. Squibb, E. R.
Various articles in the "Ephemeris," Brooklyn, 1882-1900.

611. Squire, Peter.
Companion to the British pharmacopœia. London, 1864. (Later editions).

611a. Stearns, John.
Letter to Dr. Ackerly. (Medical Repository, xi, 1807).
Observations on the Secale cornutum or ergot, etc. (New York Med. & Phys. Journ., i, 1822, pp. 278-286. Also reprinted in various medical journals).

612. Stearns, Samuel.
American herbal; or materia medica. Walpole, 1801.

613. Steidel, P.
Ueber die innere anwendung der canthariden. (Eine historische studie). Berlin, 1891.

614. Stenzel, C. G.
De Herculeis minus Herculeorum medicamentorum fructibus lactucæ exemplo demonstratis. Vitembergæ, 1745.

614a. Stephenson, J. and Churchill, J. M.
Medical botany. 4 v. London, 1828-31. (Later editions).

Digitized by Google

615. Stille, Alfred.
Therapeutics and materia medica. Phila., 1860. (Later editions).

616. Stille, A. and Maisch, J. M.
National dispensatory. Phila., 1879. (Later editions).

617. Störck, Antonius.
Libellus (primus) quo demonstratur cicutam . . . remedium utile in multis morbis. Vindobonæ, 1760. (Later editions in English, French, Dutch and Latin).
Libellus (secundus). Vindobonæ, 1761. (Later editions).
Libellus, quo demonstratur, Stramonium, Hyoscianum, Aconitum non solum tuto posse exhiberi usu interno hominibus. Vindobonæ, 1762. (French ed. Vienne, 1763).
Libellus de radice Colchici autumnalis. Vindobonæ, 1763. (English ed. London, 1764).

618. Stokes, Jonathan.
A botanical materia medica. 4 v. London, 1812.

619. Stokvis, B. J.
Leçons de pharmacothérapie. 3 v. Paris, 1896-1905. (French edition).

620. Strauss, E. G.
Ueber einige bestandtheile des copaivabalsams und über toluylenharnstoff. Tubingen, 1865.

621. Stromeyer, A. A. L.
De radice columbo. Gottingæ, 1829.

622. Susruta.
The Susruta, or system of medicine taught by Dhanwantari and composed by his disciple Susruta. 2 v. Calcutta, 1835-36.
Ayurvedas: id est medicinæ systema a venerabili D'hanvantare demonstratum. 3 v. Erlangæ, 1844-50.

Digitized by Google

623. Swediaur, F. X.
Materia medica. Venetiis, 1802. (Parisiis, 1802).
Pharmacopœia medici practici universalis. Lipsiæ, 1803. (Later editions).

624. Tabernæmontanus, J. T.
Neuw Kreuterbuch. Frankfurt am Main, 1588. (Later editions).

625. Taubert, P.
Ueber das vorkommen der gattung Physostigma in Ostafrika. (Berich. d. Deutsch Bot. Ges., xii, 1894, pp. 79-83).

626. Tavera, T. H. Pardo de.
Plantas medicinales de Filipinas. Madrid, 1892. (English ed. 1901)

627. Tavernier, J. B.
Le six voyages de J. B. Tavernier, qu'il a fait en Turquie, en Perse, et aux Indes. 2 v. Paris, 1676. (Many editions in different languages).

628. Teichmeyer, H. F.
De caapeba sive Parreira brava. Jenæ, 1729-30.

629. Tennent, John.
Epistle to Dr. Richard Mead concerning the epidemical diseases of Virginia. Edinburgh, 1738.

630. Tessari, Ludovicus.
Materia medica contracta. Venetiis, 1762.

631. Thacher, James.
American modern practice. Boston, 1817. (Later editions).
American new dispensatory. Boston, 1810. (Later editions).
Observations on hydrophobia. Plymouth, Mass., 1812.

632. Theobald, John.
Medulla medicinæ universæ, or a new compendious dispensatory. London, 1747. (Later editions).

Digitized by Google

633. Theophrastus, Eresios.
De historia et de causis plantarum libros ut latinos legeremus. Tarvisii, 1483. (Many editions).
Opera. (J. G. Schneider). Lipsiæ, 1818-1821. (F. Wimmer). Lipsiæ, 1854-62. (Many editions).

634. Therapeutic Gazette. Detroit, 1880-

635. Thompson, H.
An experimental dissertation on the Spigelia marilandica, or Indian pink. Phila., 1802.

635a. Thompson, F. A.
Abstracts from Analytical Records. (Proc. Amer. Pharm. Assoc., 1892, pp. 259-267).

636. Thomson, A. T.
Conspectus of the pharmacopœias of the London, Edinburgh and Dublin colleges of physicians. London, 1810. (Later editions).
Elements of materia medica and therapeutics. London, 1832. (Later editions, English, American and German).
London dispensatory. London, 1811. (Later editions).

637. Thomson, G.
Short method of discovering the virtues of plants. London, 1734.

638. Thomson, Samuel.
Life and medical discoveries. Boston, 1822. (Many editions).
New guide to health. Boston, 1822. (Later editions).
Thomsonian materia medica, or botanic family physician. 12 ed. Albany, 1841. (Many editions).

639. Thomson, Spencer.
Dictionary of domestic medicine. London, 1852. (Later editions.)

640. Thomsonian Manual. Boston, 1835-42.

641. Thomsonian Messenger. Norwich, Conn., 1841-3.

642. Thomsonian Recorder. Columbus, 1832-1837.

Digitized by Google

643. Thornton, R. J.
New family herbal. London, 1810.
Family herbal. London, 1814.

644. Thurneisserus, L.
Historia sive descriptio plantarum omnium, tam domesticarum quam exoticarum. Berlin, 1758.

645. Tiling, Mathias.
Rhabarbarologia, seu curiosa Rhabarbari disquisitio. Francofurti, 1679.

646. Titius, G. C.
De cinnamomo. Jenæ, 1707.

647. Tobien, A.
Beiträge zur kenntniss der veratrum-alkaloide. Dorpat, 1877.

648. Tourné, G. A.
De l'Arnica montana. (Étude botanique et chimique). Paris, 1873.

649. Tournefort, J. P. de.
Histoire des plantes qui naissent aux environs de Paris. Paris, 1698. (Later editions in French and English).

650. Tragus, Hieronymus. *See* Bock, Hieronymus.

651. Triller, D. W.
Dispensatorium pharmaceuticum universale. 2 v. Francofurti, 1764. (Later edition).

651a. Tristoan, Manoel.
A treatise of Brasill. (In Purchas, S. His pilgrimes, iv, p. 1311).

652. Trousseau, A. and Pidoux, H.
Traité de thérapeutique et matière médicale. 2 v. Paris, 1836. (Many editions).

653. Tschirch, A. and Ludtke, Frans.
Ueber ipecacuanha. (Archiv. d. Pharm. ccxxvi, 1888, pp. 441-456).

654. Tully, William.
Materia medica or pharmacology and therapeutics. Springfield, 1857-8.

Digitized by Google

655. Turner, Robert.
Botanologia; The British physician. London, 1664. (London, 1687).

656. Turner, William.
A new herbal . . . names of herbes, etc. London, 1548. (Later editions).

656a. Tussac, de.
Dictionnaire des sciences naturelles. 71 v. Paris, 1816-30. (Copayer).
Notice sur les genres et especes de differ vegataux Ipécac. (Jour. de Botanique, iv, 1813, p. 244). (Ipécac).

656b. Valentini, M. B.
Polychresta exotica in curandis affectibus contumaciccimis probatissima, etc. Francofurti ad M., 1700.

656c. Valmont-Bomare, J. C.
Dictionnaire raissone universal d'histoire naturelle. 4 v. Paris, 1764. (Calumba).

656d. Valera, Blas.
Commentarius reales. 1609.

657. Vandercolme, E.
Histoire botanique et thérapeutique des Salsepareilles. Paris, 1870.

658. Verriet, L. C.
Étude sur les aconits. Montpellier, 1873.

659. Vicat, P. R.
Matière médicales tirée de Halleri historia stirpium Helvetiæ. 2 v. Bern, 1776. (2 ed. 1791).

660. Villard, F.
Du haschisch; étude clinique, phyiologique et thérapeutique. Paris, 1872.

661. Vincent, L.
The Calabar bean. (Pharm. Jour., [3] ii, 1872, p. 906.)

662. Vitman, Fulgenzio.
De medicatis herbàrum facultatibus liber. Faventiæ, 1770.

Digitized by Google

663. Vogel, R. A.
Historia materiæ medicæ. Francofurti, 1760.

663a. Vogl, August.
Examinations of quebracho wood. "Quebracho colorado." (Proc. Amer. Pharm. Assn., 1881, pp. 231-233). (*Also in* Pharm. Jour. & Trans., July, 1880, pp. 1-2).

664. Volckmann, G. I.
De manna, ejus præsentissimo in medicina usu. Halæ Magd., 1725.

664a. Volkens, Georg.
Die flora der Aegyptisch-Arabischen wüste. Berlin, 1887. (Colocynth).

665. Vriese, W. H. de.
Plantenkunde voor apothekers en artsen. 2 v. Leiden, 1835-6.

666. Waller, J. A.
The new domestic herbal. London, 1822.

667. Walther, J. F.
De colocynthide. Halæ Magd., 1734.

668. Wardleworth, T. H.
An essay on the chemical, botanical, physical and parturient properties of the Secale cornutum. London, 1840.

669. Waring, E. J.
Pharmacopœia of India. London, 1868.
Remarks on the uses of some of the bazaar medicines and common medical plants of India. Travancore, 1860. (Later editions).

670. Watson, E.
The use of the calabar bean in tetanus. (Pharm. Jour. [2] viii, 1877, p. 614; [3] i, 1870-71, p. 586).

671. Weddell, H. A.
Note sur le Cephælis ipecacuanha. (Ann. Sci. Nat., [3] Botan., xi, 1849, pp. 193-202).
Notise sur la Coca, sa culture, préparation, etc. (Mém. Soc. Imp. et Centr. d'Agriculture, St. Petersburg, Ire partie, 1853, p. 141).

Digitized by Google

672. Wedel, C.
De elatere. Jenæ, 1699.

673. Wedel, G. W.
De resina Ægyptia Plauti. Jenæ, 1700.
De rhabarbari origine. Jenæ, 1708.
De sabina scripturæ. Jenæ, 1707.

674. Wedel, J. A.
De camphora. Jenæ, 1697.

675. Weissheit, B.
De salvia. Jenæ, 1715.

676. Weissius, J. C.
Dissertatio de malo punico. Altdorfii, 1712.

677. Wellcome chemical research laboratories, London. Publications, 1897-

678. Wellcome research laboratory. Gordon Memorial College, Khartoum. Report, 1904.

679. Wepfer, J. J.
Cicutæ aquaticæ historia et noxæ, commentario illustrata. Basileæ, 1679. (Later editions).

679a. Western Druggist, Chicago, 1879-

680. Western Medical Reformer. Worthington, 1836-48.

681. Weyl, J. M.
De nuce vomica. Lugduni Batavorum, 1798.

682. Weynton, O.
Commercial products of Assam. (Pharm. Jour., [3], xviii, 1887, pp. 144-147; 161-163).

683. Whitlaw, Charles.
New medical discoveries. 2 v. London, 1829.

684. Wickman, Daniel.
Viola ipecacuanha. Diss. Upsaliæ, 1774.

685. Wiedermann, C.
Ueber die wirkung des camphers auf den thierorganismus. Dorpat, 1877.

686. Wilberding, J. H. A.
De aurantiis eorumque eximo usu medico. Helmæstadii, 1741.

Digitized by Google

687. Wilhelmi, J.
De terebinthina. Halæ Magdeb., 1699.

688. Wilkinson, J. G.
A popular account of the ancient Egyptians. 2 v. New York, 1854.

689. Will, G. P.
Exercitatio medica de styrace. Altorfii, 1736.

690. Williams, S. W.
Report on the indigenous medical botany of Massachusetts. (Trans. Amer. Med. Assoc., ii, 1849).

691. Winston, I.
Dissertation on the Polygala senega, commonly called Seneca snake-root. Phila., 1798.

692. Winterbottom, T. M.
Account of the native Africans in the neighborhood of Sierra Leone. 2 v. London, 1803. (Physostigma).

693. Withering, William.
Miscellaneous tracts. 2 v. London, 1822.
The foxglove and some of its medicinal uses. Birmingham, 1785.

694. Witte, O.
Ueber die rinde von Xanthoxylum frazineum Willd. Göttingen, 1876.

695. Wittke, A. F.
De arnicæ virtute propria atque specifica. Lipsiæ, 1785.

696. Wittstein, G. C.
Etymologisch-botanisches handwörterbuch. Ansbach, 1852. (Later edition).

697. Wolff, E.
De Colchici autumnalis usu medico. Berolini, 1818.

698. Wood, G. B. and Bache, W.
Dispensatory of the United States. Phila., 1833. (Later editions).

699. Wood, H. C. Jr.,
Therapeutics, comprising materia medica and toxicology. Phila., 1874. (Later editions).

Digitized by Google

700. Woodhull, A. A.
Studies, chiefly clinical, in the non-emetic use of ipecacuanha. Phila., 1876.

701. Woodville, William.
Medical botany. 4 v. London, 1790-4. (2 ed. 4 v. 1810. 3 ed. 5 v. 1832).

702. Worcester Journal of Medicine. Worcester, 1852-6.

703. Worthy, A. N.
Treatise on the botanic theory and practice of medicine. Forsyth, Geo., 1842.

704. Würtz, G. C.
Conamen mappæ medicamentorum simplicium. Argentorati, 1778.

705. Zarda, A. V.
Pharmaca vegetabilia juxta pharmacopœam Austriaco-provincialem. Pragæ, 1782. (2 ed. 1792.)

706. Zollickoffer, Wm.
Materia medica of the United States. Baltimore, 1819. (2 ed. 1826).

707. Zorn, Johannes.
Icones plantarum medicinalium. 6 v. Nurnberg, 1779-90.

Digitized by Google

INDEX TO PERSONAL NAMES

In several instances, the author has failed to locate needful given names, for example, p. 128, Drs. Ash and Cawley, credited by Withering as first to introduce Digitalis to the medical profession. Again, p. 45, might be cited "Biararslan," reputed to have introduced Cannabis to Persia. The text connection often establishes a person's field of service and this is accordingly given in parenthesis. For example, p. 149, Boiveau, (a French apothecary,) who originated "Rob de Laffecteur," the progenitor of "Swaim's Panacea."

In other instances, a name is all-sufficient, as for example, Dymock, Galen, Paracelsus, Flückiger, etc. Occasionally, names spelled differently by good authorities, makes it necessary to select the form of spelling that appeals to the writer.

	Page
Acosta, Christobal	119
Acosta, Joseph	64
Adair, Dr. C. H	266
Adanson	300
Ægineta, Paulus	153
Aëtius Amidenus	217, 332
Agnew, Dr. D. Hayes	98
Ainslie, W	120
Aitchison (Peruvian Traveler)	22, 270
Aiton, William	351
Alhervi (See Bibliography)	333
Allaire, C. B	106, 108
Alexander Trallianus,	141, 269, 288
Allion, M	149
Ali Istakhri	19, 21
Alpiar, Agop	230, 298
Amatus Lusitanus	33
Amoreaux, P. J	29
Anderson, Dr. A	137
Anderson, Dr. E. A	152
Anderson, Dr. James	37
Andronicus II	206
Andronicus III	207
Arata, Pedro N	24
Apicius, Coelius	117
Arnaud (Chemist)	330
Arrot (Del. Peruvian Bark)	68
Ash, Dr. (Fox Glove)	128
Avicenna (See Bibliography)	26, 333, 334
Bache, W	124
Baillon, H	38, 111
Bainbridge (Chemist)	14
Baker, Dr. W. F	129
Balfour, Dr. J. H	239
Ball, T	106
Barbosa, O	48, 142, 224
Bartholow, M.D., Prof. Roberts	95, 152, 186
Barton, M.D., Prof. Benj. Smith	57, 60, 137, 146, 150, 165, 184, 283, 321, 339, 351, 354
Barton, Dr. W. P. C	146, 316
Bastin, Prof. E. S	352
Bauhinus (Bauhin), Casper,	119, 300
Bauhinus (Bauhin), Joh.,	121, 158, 290, 293, 300
Beach, Dr. Wooster,	61, 135, 145, 185, 352
Benedictus, Crispus	269
Benjamin of Tudela	247
Bennett, Dr. Alexander	93
Benson, Prof. L. W	355
Bentham, George	326
Bentley, Robert	111, 115
Beringer, George M	331, 343
Berry, Dr. Andrew	35, 37
Berthelot, M	196
Betherand, Dr	355
Bigelow, Jacob,	60, 137, 146, 149, 283, 339, 351
Biraralan (Indian Pilgrim),	45
Blom, Carolus M	260
Blondel, R	326
Bock, Hieronymus	6
Boerhaave, Hermann	303
Bohm, Jacob	15

Digitized by Google

Page

Boiveau (French Apothecary) 149
Bojer, W. 37
Bonpland, Aime 28
Borellus, Peter 119
Bosch, H. 125
Brotero, F. A. 168, 172
Brown, Walter F. 127
Browne, J. Ross 184, 196
Bruce, James 123
Brunfels, Otto 297
Buchan, Dr. William ...242, 249
Bundy, Dr. J. H. ...31, 133, 264
Burck, Dr. (Botanist, see Coca) 91
Burgos, Dr. (See Heading). 24
Burroughs, Wellcome & Co. 331
Burton, R. F.,
5, 16, 39, 41, 44, 106, 122, 158, 279
Byron (Lord) 274
Camerarius, Joachim 17
Canfield, Dr. C. A. 159
Canisares, Lopes de 69
Cardano, Girolamo 189
Caspari, Charles 175
Caterina Cornaro (Queen of Cyprus) 30
Catesby, Mark 294
Catlin, George 184
Cato, Marcus Porcius, 117, 158, 278
Cawley, Dr. (See Heading). 128
Celsus, A. C.,
31, 33, 158, 224, 268, 297
Ceres (Godess) 103
Champagne, Count of 272
Chapman, N. 137
Charlard, Boutron 262
Charlemagne,
14, 16, 17, 117, 138, 140, 183, 278
Chilperic II (French King), 16, 139
Chilton 145, 149
Chinchon, Countess of 68, 70
Christison, Dr. Robert 238
Churchill | (Medical Botany) 216
Ciese de Leon, Pedrode 288
Claquenelle (Apothecary of Paris, see Ipecac) 170
Clarke, W. (Explorer) 184
Clavijero, Padre Franc. Jav. 201
Clusius, Carolus,
5, 19, 28, 38, 85, 169, 245, 290, 293, 342
Clutterbuck, Robert 130

Page

Coelius, Apicius 117
Cohausen, J. H. 120
Coimbra, Don Pedro 172
Colbert, Jean Baptiste 170
Condamine, C. M. 63, 73
Collin, Eugene 19
Collinson, Peter 351
Colon (Apothecary of Lyons) 176
Commelyn, Caspar 119
Commerson, Philbert 37
Constantinus, Africanus.122, 269
Conti, Nicolo 247
Conwell 120
Corey, Dr. W. M. 303
Cordus, Valerius 15, 23
Courtright, Dr. G. S. 152
Coutinho, Dr. S. 243
Coville, Frederick V. 35
Cowley, Abraham 101
Coxe, J. R. .147, 176, 179, 304
Crawfurd, George 143
Crescensio, Pietro 322
Cube, Johann von 334
Cullen, William 304
Culpeper, Nicolas 216, 281
Cutler, Rev. Manasseh, 165, 183, 261, 283, 314, 351
Cytherea (Surname of Venus) 102
Dahlberg, Carol Gust. 260
Dalhamah, Al. 106
Dale, Samuel ...9, 119, 121, 180
Daniell, Dr. W. F. 237
Daries, P. J. A. 29
Davis, Dr. N. S. 62
Davis, Dr. John 355
Darwin, Robert Waring.304, 341
de Candolle, A. P.,
37, 56, 157, 168, 179, 259, 324, 326
de Chastetus, M. 160
Dekker, Fried. 170
de La chaise, Franc. 171
de Laet, Jean 161, 291, 293
de Orta, Garcia ...123, 285, 334
de Salvy, M. 134
Desfontaines, R. L. 111
Desgranges, J. B. 131
de Tudela, Benj. 217
de Tussac 114
Diocletian (Caius Valerius Aurelius) 320
Dioscorides,
1, 5, 6, 7, 14, 16, 20, 22, 23, 31, 49, 83, 104, 130, 152, 153, 158,

Digitized by Google

Page
166, 206, 224, 246, 259, 278, 279, 281, 287, 297, 298, 321, 337, 338, 340
Dodonæus, Rembert....288, 338
Dohme, Dr. A. R. L. (Chairman of Committee), 13, 91, 131, 166, 175, 233, 245, 265, 267, 324
Don, George.....239, 300, 329
Dowdeswell, G. F.....85, 96
Downey, Dr. William..... 283
Drake, Dr. S. G..... 184
Drummond, Dr. Edward... 109
Duncan, Andrew, Jr..... 177
Dunglison, Dr. Robley..61, 165
Durand, Pierre Bernard..60, 198
Dymock, W. W., 3, 20, 29, 34, 51, 118, 271, 280, 285, 287, 333
Eaton, Amos..... 56
Ebers, G. B..... 117
Eckler, Charles R.....129, 156
Edrisi (See Bibliography), 16, 21, 50, 121, 247, 269
Edward I.....16, 123
Edward IV..... 17
Edwards, H. M..... 60
Elliott, Stephen.....54, 151
Endlicher, Stephen Ladislaus..... 294
Engelhardt, Dr. Hermann.. 267
Epimenides..... 298
Esculapius..... 74
Ewell, James..... 60
Ezekiel (Prophet).....33, 83
Faber, A..... 14
Faber, J. M..... 29
Fallopius, Gabriello..... 222
Farwell, Oliver A..... 353
Fermin, Phillippus..... 261
Felter, Dr. H. W. (See Introduction)
Ferriar, J..... 125
Finch, William..... 6
Floridus, Macer..... 278
Flückiger, F. A., 16, 49, 64, 65, 69, 111, 112, 116, 122, 138, 141, 143, 161, 176, 192, 193, 202, 206, 213, 222, 264, 267, 270, 292
Folcs, Hans..... 123
Forskal, Pehr..... 259
Forster, Johann..... 301
Fortin, M..... 37
Fothergill, John..... 177
Francis, Dr. J. M. (Committee member, see Introduction)
Fraser, Th. R..... 328
Fraude, G..... 24
Frederick (The Great)..... 23
Fuchs, R..... 125
Fuchs, Leonard..... 29
Galen, Claudius..5, 41, 52, 83
Gallesio, Giorgia..... 26
Garden, T. S..... 60
Gärtner, Joseph..... 179
Gaubius, H. D..... 36
Gentius (King of Illyria)... 152
Geoffroy, E. F.....119, 235
Gerarde, John.....299, 319, 340
Gesner, Conrad.....19, 297
Gomes, Dr. B. A..... 172
Goss, Dr. I. J. M.....277, 353
Gray, S. F..... 54
Griffith, R. E..... 61
Gryg, Rhys..... 3
Guerin, Jules..... 28
Guibourt, N. J. B. G..... 22
Haidar (Sheikh.)..... 46
Hale, Dr. E. M.....178, 186
Hanbury, Daniel, 49, 141, 192, 193, 206, 213, 270, 293
Hand, W. M..... 165
Hartwich, C..... 326
Harvey, Gideon..... 74
Haskell, Dr. C. C..... 129
Hayne, F. G..... 115
Helvetius, J. A..... 170
Hembold, Dr. (See Buchu).. 32
Henry, Jr..... 262
Henry VIII..... 138
Hernandes, Francisco, 27, 291, 342
Heraclides of Tarentum.... 31
Herera (See Manna)..... 195
Herodotus, 41, 46, 83, 167, 220, 279
Herr, Michael..... 112
Hesse, O.....24, 90
Heyroth, Prof. Francis (See Introduction) 166, 245, 267
Hildegarde, Abbatissa Bingenensis.....40, 50, 122
Hilgard, J. E..... 198
Himly, K. G..... 29
Hippocrates..... 47
von Hirschheydt, E..... 120
Hires, Charles A..... 342
Hodgson, Jr., William..... 250

Digitized by Google

Page

Hoffman, Casper..... 222
Holmes, E. M.,
10, 150, 237, 243, 244, 300, 326
Hooker, J. D.....106, 174, 326
Hooker, Sir W. J.....37, 85, 92
Hooper, Robert..... 216
Hosack, Dr. David..... 137
Howard, Dr. Horton..... 60
Howe, Dr. A. J..... 351
Hull, Dr. W. C..... 152
von Humboldt, E..28, 63, 343
von Hutton, Ulrich..... 159
Ibn Batuta.....30, 247
Ibn el Beithar..... 6
Ibn Jasla..... 271
Ibn Khurdadbah..... 247
Ibn Sina.....21, 270
Imru-l-Kais..... 39
Irving, Ralph.....65, 71
Isaac Judæus..... 318
Isidore (Archbishop of Seville..... 50
Jacquin, Nic. Jos..114, 300, 301
Joannes, Actuarius..... 52
Joel, Franz..... 19
John of France..... 17
Johnson, Thomas..... 319
Johnson and Johnson..... 29
Josselyn, John...259, 351, 352
Juno (Godess)..... 158
Jussieu, Joseph de..... 65
Kalm, Peter..145, 165, 294, 351
Kämpfer, E..... 225
Karsten (Botanist).....113, 294
King, C..... 198
King, M.D., Prof. John,
61, 124, 151, 162, 181, 249, 256, 261, 323, 353, 354
Kip, W. I..... 195
Kœhler, Hermann..... 34
Koller (Discoverer of Anesthetic qualities of Cocaine).....91, 98
Kopp (See Nutgall)..... 141
Kost, J..... 165
Kosteletsky, B. F..... 301
Kraemer, Henry..... 271
Kremers, Prof. Ed..... 277
Krusenstern, A. J..... 111
Kundsen, Prof. Lewis..... 29
Kuntze, O..... 295
Kurts, Kate F..... 59
Labat, J. B.....8, 114, 343
La Condamine, Chas. Marie, 63, 73
Lallemand, A..... 336

Page

Lamarck, J. B..6, 37, 50, 179
Lassen, Christian..... 268
Ledebour, K. F..... 299
Leeuwenhoek, Anton v..... 35
Lemaire (Botanist)..... 243
Leo Africanus..... 217
Leo X (Pope)..... 112
Lewis, Daniel.....304, 312
Lewis, John R..... 250
Lewis, M..... 184
Lewis, W.....180, 222
Lewton, Frederick L..... 25
Lilly, Eli, and Company... 324
Link.....
Linnæus, Carl,
54, 57, 70, 109, 114, 117, 121, 168, 171, 246, 260, 294, 301, 339, 351
Linné (See Linnæus, Carl).
Lippich (of Padua)..... 301
Livingstone, David..... 327
Lloyd, C. G.,
11, 56, 133, 156, 185, 266, 341
Lloyd, John Thomas..... 88
Lloyd, John Uri...90, 185, 194
Lloyd Library..... 101
Lugo (Cardinal)..... 71
Lonicer, Adam..... 131
Long, S. H..... 184
Louis XIV..... 24
Lyon, Dr. A. B..... 25
Lyon, Liège A..... 194
Macer, Floridus..... 278
Maish, Prof. John M.,
90, 133, 301, 351
Marcellinus Ammasnus..... 268
Marcellus, Empiricus..... 153
Marcgraf, Georg..... 169
Marcgrav, Georgii.....113, 114
Markham, Robert Clements,
64, 67, 70, 92
von Martius, C. F., 160, 171, 218
Martin, Hugh..... 90
Martius, T. W. C..... 301
Martys, Petrus..... 112
Masudi, Abn-l-Hasan..... 121
Mathieu, Daniel..... 23
Matthæus Platearius..... 20
Matico (name of Spanish soldier)..... 154
Matthioli, Dr. Pietro Andrea....19, 109, 154, 281, 300
Mattson, Dr. Morris..... 184
Melech, Elmaydi..... 30
Merrell, Dr. Wm. S....251, 256
Merat, F. V..... 170

Digitized by Google

	Page
Mesuë (Arabian Author)	5, 269
Meyer (Gesch. d. Bot.)	182
Meyer, Arthur	175
Michaux, Andre	57, 352
Mayo, Caswell A. (Chairman Publication Committee. See Introduction).	
Mehrban, Ardeshir	22
Meluca (Garcilasso de Vega)	64
Merrell, Dr. Charles G	148, 253
Michaux, F. A.	294
Miers (Botanist)	38
Miller, Dr. F. A.	129
Mitchell, John S	52
Mœnch (Botanist)	300
Mohammed I.	
Molina, G. I.	262
Monardes, Nicolaus,	27, 28, 85, 176, 288, 290, 293
Moore, Thomas	275
Moore, Charles W.	18
Moore, Francis	177
Moore, J.	125
Morgan, Sir Thomas Charles	28
Mortimer, Dr. W. G.	85
Morris, C.	258
Moses	33, 157
Moses (of Chorene)	279
Motherby, Georges	180, 218
Müller Argovensis	168
Mumin, Muhammad	22
Münch, B. F.	29
Murrell, Dr. Wm.	152
Mutis, Don Jose Celestino,	62, 171
Naudin (French Botanist)	105
Navarro, Juan R.	201
Nero (Emperor)	21
Neumann, Kasper	336
Newberry, John S.	196
Nicholas Myrepeus	20
Norris, Dr. G. H.	60
Norton, Prof. Thos. H.	337
Nouffer, Madame	23
Noyes, Dr. Henry D.	98
Nuttall, Thomas,	54, 57, 158, 184
Odoric (Italian Friar)	122
Olivier, G. A.	141
Omelochilus (South American Diety)	101
Oribasius, D.	153, 338
O'Shaughnessy, W. B.	46
Otho of Cremona	20
Ott, Dr. Isaac	152
de Oviedo, Valdes G. F.	159
Owen (Captain W. F.)	37
Pachamama (Mother of Coca)	102
Parke, Davis & Company,	24, 31, 100, 133, 159, 264, 353
Parkinson, John,	125, 216, 221, 245
Parsons, Henry B.	98
Parrish, Prof.	252
Paulus Ægineta	332
Pax, F.	326
Peachey, Dr. John	76
Pelikan (Dr.)	328
Penzolt, Dr. F.	24
Percival, T.	36
Perry, Commodore Wicham	13
Persoon, C. H.	168
Peschier, J.	24
Peterson, Andreas	286
Petrus Martys	112
Physicians, Conclave of	76
Physick, P. S.	304
Pickering, Charles	292
Picolo, F. M.	194
Piso, Guilelmus,	113, 114, 289, 293
Planchon	76
Pliny,	1, 5, 16, 20, 21, 22, 23, 31, 49, 117, 139, 141, 158, 183, 206, 220, 224, 246, 259, 268, 278, 281, 297, 298, 320, 321, 338, 340
Plumier, Charles	243
Plukenet, Leonard	55, 294
Poeppig, Dr. Eduard	85, 87, 92
Poll, Nicholaus	159
Polo, Marco	122, 269, 285
Pomet, Pierre	342
Pond, Dr.	162
Pope Pius V.	27
Porcher, Dr. Francis Peyre,	151, 261
Powell, M.D., Prof. W. Byrd	181
Powers, Dr. Frederick B.	18
Price, Dr. V. C.	349
Pring, Martin	292
Proctor, Prof. Wm.	239
Proust	194
Pughe, John	3
Pursh, Fred. T	56, 57, 137, 158, 294
Purchas, Samuel	6, 169
Quackinboss, Dr. A. L.	149
Queen Elisabeth	28
Quekett, E. J.	131

Digitized by Google

Page

Quincy, John..... 180
Rafinesque, C. S., 56, 60, 137, 150, 165, 184, 261, 276, 296, 323, 339, 351, 352
Ramel, Dr. (of Valencia).. 134
Rameses III..... 1
Randall, A. G..... 201
Rathlaw (Dutch physician) 131
Ray, John....119, 131, 171, 215
Redi, Franciscus..... 35
Reece, Dr. Richard..... 178
Reed, Prof. T. D..... 108
Relph, Dr. John..... 67
Revoil (African Explorer).. 330
Rhazes..... 279
van Rheede, tot Draakestein, H. A.....33, 119
Rhys Gryg..... 3
Rice, Dr. Chas...110, 181, 182
Richard, Achille.....168, 344
Richardson, Dr. Benj. Ward, 136
Rimmel, Eugene.....217, 274
Ringer, Dr. Sidney..... 152
Rolander, Daniel..... 260
Roxburgh, W.....4, 35, 53
Roylston, Wm..... 138
Ruel, Jean (Ruellius)..... 288
Rufus (of Ephesus)..... 297
Ruiz, Hipolito..... 178
Rumphius, Georg Everard, 119, 143
Rusby, Prof. H. H., 96, 100, 160, 174, 244, 271
Ruschenberger, Dr. W. S. W. 262
Rush, Benjamin..... 304
Russell, Dr. Alexander..217, 297
Saladinus Asculanus, 123, 154, 288, 340
Salmon, William..... 180
Sanborn, P. E..... 165
San Vicente, N. G..... 201
Sarver, J. Ch..... 346
Sayre, Prof. L. E..108, 152, 335
Seba, Albert..... 261
Semmedus, J. C..... 36
Schär, Prof. Ed.....193, 202
Schenck, Dr. Henry..... 309
Scherzer, Karl..... 92
Schmaus, Leonard..... 159
Schœpf, J. David, 60, 137, 165, 184, 283, 294, 321, 338, 351
Schultes,..... 300
Scopoli, Dr. J. N..... 300
Scott, Joannes..... 117
Scott, Dr. John..... 152

Page

Scribonius Largus.....15, 268
Scudder, Dr. J. M.....133, 185
Seabury and Johnson..... 29
Sharp and Dohme.....91, 132
Short, Thomas.....120, 267
Simmonds, P. L.....9, 10
Sloane, Sir Hans..... 246
Smith, Dr. Elisha..... 165
Smith, Greig..... 2
Smith, Peter.....60, 181, 248
Smith, Porter..... 142
Socrates..... 109
Solander, William..... 351
Spalding, L..... 306
Squibb, Dr. E. R., 12, 96, 109, 233, 302
Squire, Peter..... 29
Stanley, Henry M..... 331
Stearns, Dr. John..... 131
Stearns, Dr. Samuel..... 184
Steele, James G..... 159
Stephenson, J..... 216
Stewart, Margaret..... 101
Stiles, Dr. J..... 263
Störck, Antonius, 4, 104, 109, 166
Strabo, C. T..... 83
Swarts, Olaus or Olof..... 168
Sydenham, Dr. Thomas...69, 74
Taubert, P..... 237
Tavernier, J. B..... 217
Taylor, Alex. S..... 199
Thacher, Dr. James, 137, 283, 303, 351, 354
Theocritus..... 140
Theophrastus, 1, 15, 16, 20, 23, 33, 83, 130, 141, 158, 206, 220, 224, 246 279, 281, 297, 298, 320, 337
Thompson, F. A..... 24
Thomson, Dr. Samuel, 48, 183, 185
Thomson, Rev. W. C..... 239
Thucydides..... 183
Todhunter..... 53
Tonga (and Durand)..... 60
Torrey, Dr. John..... 54
Tournefort, J. P. de..... 56
Tragus, Hieronymus, 104, 125, 153, 158
Trimen, H.....111, 115
Tristaon, Manoel.....112, 169
Tschirch, Prof. A..... 12
Tschudi. J. J. von..... 92
Tully, Dr. William..... 316
Turner, Robert.....52, 216

Digitized by Google

	Page
Ulloa, Don Antonio	63
Valera, Blas (Jesuit Father),	87
Valmont, Bomare	36
Van Derveer, Dr. Henry	308
Van Derveer, Dr. Lawerence	302
Van Wett, Peter	9
Veatch, John A	200
Vega, Dr. Juan de	69
de Vega, Garcelasso	64
Venus (Godess)	102, 103
Virococha, Pacchamacus	102
Volkens, Georg	107
Volz, Dr. August	24
Waddell, Rev. (missionary)	238
Waldbott, Dr. Sigmund (author, Vol. 2. See Introduction)	38, 116, 166, 245, 267
Wallace, E. S	107
Wallace Brothers	155
Walters, Dr. A. L	129
Waring, E. J	3, 40, 46
Watson, Sereno	198
Walz, G. F	110
Weddell, H. A	65, 90, 92, 173
Wellcome, Henry S	33, 66, 133
Weynton, O	118
Wilkes, I	196
Wilkinson, Sir Gardner	333
Wilbert, Dr. M. I	126
Willdenow, Carl Ludwig,	1, 123, 168
William the Conqueror	163
Williams, Stephen W	310
Willis, Dr. Thomas	76
Winterbottom, Dr. T. M	239
Wistar, Dr. Casper	
Withering, William	125, 129
Wœhler, Fredrick	90
Wood, C. B	61, 124
Woodruff, W. J. (See Introduction)	
Wormley, Prof. T. J	152
Wright, Dr. Thomas	260
Ximines, Francisco	291
Zaccarias, Benedetto	206
Zein, Haji	21
Zein-el-attar, Haji	270
Zollickoffer, William,	137, 352, 354

Digitized by Google

Digitized by Google

INDEX

	Page
Abutua	235
Acacia	1
Acacia catechu	142
Acacia Senegal	1
Acacia suma	142
Acacias	200
Account of Indigenous Vegetables	184
Acer macrophyllum	197
Acer spicatum	353
Acid, benzoic	30
Acid, chrysophanic	54
Aconite	3
Aconitum	3
Aconitum Napellus	3
Acorus Calamus	33
Acorn caps	141
Actæa alba	55
Actæa racemosa	54
Actæa spicata	55
Adansonia digitata	329
Atropa caule herbaceo	300
Agave	200
Agropyron repens	338
Alcarahueya	50
Allspice	245
Allum	282
Almond, bitter	15
Almond, sweet	15
Almonds	122, 139
Almonds, oil of	16
Aloe	4
Aloe ferox	4
Aloe hepatica	12
Aloe lucida	12
Aloe of Bible	4
Aloe Perryi	4, 13
Aloe plant	200
Aloe socotrina	6
Aloe vera	4
Aloes	4
Aloes, Barbadoes	8, 11
Aloes, caballine	8
Aloes, Cape	4, 11
Aloes, Curaçao	4, 11
Aloes, hepatic	8
Aloes, horse	8
Aloes, Indian	11
Aloes, ligna	5
Aloes, Mocha	11
Aloes, Natal	11
Aloes, Socotrine	4, 5, 8, 11
Aloes vulgaris, var. chinensis	10
Aloes-wood, burnt	5
Althæa	14
Althæa flowers	14
Althæa root	14
Ambergreese, blacke	6
Ambergris	5, 285
American Dispensatory	18
American false manna	195
American hellebore	350
American Indian (dyes employed by)	164
American Indian hemp	17
American manna	193
American pennyroyal	162
American valerian	124
Amlika	334
Amygdala Amara	15
Amygdala Dulcis	15
Amygdalus communis	15
Anacyclus Pyrethrum	259
Andalusian caraway	50
Andira Araroba	54
Anhuiba	291
Anise	16, 50
Aniseed	16
Aniseed oil	210
Anisophyllum acutifolium	121
Anisum	16
Anisum, oil of	16
Anjudan, black	21
Anjudan, white	21
Anthemis	17, 259
Anthemis nobilis	17, 213
Antidote, poison	152
Antidote, tobacco	152
Aphides	198
Apocynaceæ	326, 330
Apocynum	17, 173
Apocynum androsæmifolium	17
Apocynum cannabinum	17
Apollo, temple of	84
Apple, bitter	105
Apple, colocynth	105

Digitized by Google

	Page
Apple, purging	119
Aquillaria agallocha	4
Arabian date palm	200
Arabian Nights, 5, 15, 39, 47, 106, 138, 157, 167, 214, 273	
Arabian physicians	1
Arabic, gum	1
Aracati jaborandi	243
Aracus aromaticus	342
Arbor febrifuga Peruviana	68
Arbrisseaux	194
Arcana Naturæ	36
Arctium Lappa	179
Arctostaplylos Uva ursi	339
Aristolochia reticulata	319
Aristolochia Serpentaria	319
Armenian cumin	50
ARNICA	18
Arnica flowers	18
Arnica montana	18
Arnica root	18
Arrow poisons, (notes on)	328
Arsenic	284
Artemisia pauciflora	287
Arundo Phragmites	202
ASAFETIDA	19
Asclepiadaceæ	326
Ash, manna	192
ASPIDIUM	23
ASPIDOSPERMA	24
Aspidosperma Quebracho blanco	24
Assay of ergot	131
Astragalus gummifera	337
Atropa Belladonna	28
Atropine (stramonium)	324
Attar of roses	272
AURANTII AMARI ET DULCIS CORTEX	25
Avi-karni	223
Balm, mountain	133
Balsam, Canada	335
Balsam, copaiba	111, 235
Balsam, Guatemala	27
Balsam, Peru	26, 114
Balsam of Tolu	27, 114
Balsam tree, Peru	112
BALSAMUM PERUVIANUM	26
Balsamum Toluifera	27
BALSAMUM TOLUTANUM	27
Bana	44
Bane, leopard's	18
Banjawi	30
Baobab tree	329
Barbadoes aloes	8
Barberry	31
Barium carbonate	136
Bardana	180
Bark, casca	240
Bark, chittim	266
Bark, cinchona	62
Bark, Colombian	62
Bark, cotton root	155
Bark, cramp	352
Bark, elm	338
Bark, Jesuits'	68
Bark, Loxa	62
Bark, medicine	66
Bark, Peruvian	19, 62
Bark, pomegranate	156
Bark, sacred	266
Bark, salve	338
Bark, sassy	240
Bark, soap	262
Barks, nine	135
Barks, seven	135
Barley	191
Barosma	32
Barosma betulina	32
Barosma serratifolia	32
Bast	42
Baunilha	350
Bavarian hops	163
Bdellium	221
Bean, Calabar	236
Bean, ordeal	236
Bearberry	339
Bees' wax	214
Belladonna	28, 300, 301
BELLADONNAE RADIX ET FOLIA	28
Belladonna leaves	28
Belladonna root	28
Bengal Dispensatory	46
Benjamin	30
Benjamin, gum	30
Bent grass	202
Benzoë	30
Benzoic acid	30
Benzoin	30, 270
BENZOINUM	30
Bensui	30
BERBERIS	31
Berberis aquifolium	31, 265
Berberis Canadensis, berries of	31
Berberis vulgaris	31
Berries, buckthorn	263
Berries, cubeb	122
Berries, Berberis canadensis,	31
Berries, pimento	245

Digitized by Google

	Page
Berries, sumach	272
Berries, phytolacca	240
Berries, prickly-ash	354
Berry, partridge	144, 146
Berry, pungent	248
Beta vulgaris var. Rapa	278
Betel nut	143
Betula lenta	145, 147
Bhang	40
Bhanga	40
Bible, aloe of	4
Bibliography, pages 357 to 424	
Bidara-laut	223
Bikh	4
Birch, sweet	145
Bish	4
Bitter almond	15
Bitter and sweet orange	25
Bitter apple	105
Black anjudan	21
Blackberry	276
Blackberry cordial	277
Blackberry cordial of Kentucky	52
Black cohosh	54, 55
Blacke ambergreese	6
Black haw	353
Black mechoacan	176
Black mustard	320
Black pepper	123, 246
Black root	180
Black snakeroot	54
Bloodroot	282
Blue cohosh	55
Blue gum leaves	134
Blus mass	273
Bonduc nut	118
Boneset	137
Book of Perfumes	274
Borax, honey of	214
Border, leek of the	109
Botrophis Serpentaria	56, 58
Bourbon vanilla	347
Bowman root	180
Brinton root	180
Broom	299
Buchu	32
Buchu leaves	32
Buckthorn	140
Buckthorn berries	263
Buckthorn, syrup of	264
Bugbane	55
Bugwort	55
Burdock	179
Burnt aloes-wood	5
Butua	235

	Page
Cabueriba	112
Cadel avanacu	119
Cæsalpinias	111
Cæsalpinia Bonducella	118
Calabash	114
Calabar bean	236
Calamus	33, 218
Calendula	34
Calendula officinalis	34
California manna	193
Callicocca Ipecacuanha	168, 172
Calumba	34
Calumba root	34
Calumbe	36
Cambogia	38
Camphora	39
Camphor	39
Camphor of thyme	336
Canaan gum	1
Canada balsam	335
Canadian hemp	17
Candied cubebs	122
Candy, horehound	205
Cane sugar	199
Canes, honey of	279
Cannabis	40, 46
Cannabis Americana	40
Cannabis Indica	18, 40, 225
Cannabis sativa	40
Cantharides	47
Cantharis	47
Cantharis vesicatoria	47
Cape aloes	4
Cap-leaf	22
Caps, acorn	141
Capsicum	48
Capsicum frutescens	48
Capsicum and myrrh, tincture	48
Caraway	49
Caraway, Andalusian	50
Caraway, Persian	50
Caraway seed	49
Cardamom	48, 225
Cardamon, round	245
Cardamom seeds	49
Cardamomum	48
Carica	139
Caricæ	139
Carolina jessamine	150
Cartagena Ipecac	168
Carui	50
Carum	49
Carum Carvi	49
Caryophyllus	51
Casca bark	240

Digitized by Google

	Page
Cascara sagrada.....134,	263
Cascara sagrada, chemistry of.....	267
Cassia.....83,	220
Cassia acutifolia.....	318
Cassia angustifolia.....	318
Cassiæ oleum.....	84
CASSIA FISTULA.....	52
Cassia, purging.....	52
Cassine.....	292
Cataputiæ minores.....	119
Catechu.....142,	143
Cathay seeds.....	118
Catholicons.....	145
Caulophyllum thalictroides.	55
Cayenne pepper.....	48
Ceari jaborandi.....	243
Celsus.....	31
Century plant.....	200
Cephaëlis acuminata.....	168
Cephaëlis emetica.....	168
Cephaëlis Ipecacuanha..168,	172
Ceylon cinnamon.....	84
Chamomile.....	17
Chamomile, German.....	213
Chamomile, Roman.....17,	213
Chamomile, Spanish.....	259
Chandana.....	286
Chasmanthera columba....	38
Cherry bark, wild black....	257
Cherry, wild.....	257
CHIMAPHILA.....	52
Chimaphila umbellata.....	52
China.....	67
Chinanepide.....	67
Chionanthus.....	302
CHIRATA.....	53
Chiretta.....	53
Chittim bark.....	266
Chittim wood.....	264
Chondrodendron tomentosum.....	235
CHONDRUS.....	53
Chondrus crispus.....	53
Christophoriana Canadensis racemosa.....	55
Chrysanthemum Parthenium.....	213
Chrysarobin.....	54
CHRYSAROBINUM.....	54
Chrysophanic acid.....	54
Chukri.....	270
Cicuta.....	109
Cicuta virosa.....	109
CIMICIFUGA.....	54
Cimicifuga alata.....	57

	Page
Cimicifuga americana.....	57
Cimicifuga fetida.....	57
Cimicifuga racemosa.....	54
Cimicifuga Serpentaria.....	54
CINCHONA.....62, 168,	185
Cinchona bark.....	62
Cinchona Calisaya.....	62
Cinchona lancifolia.....	62
Cinchona Ledgeriana.....	62
Cinchona officinalis.....62,	68
Cinchona, red.....	62
Cinchona succirubra.....	62
Cinchona, yellow.....	62
Cinnamomum Camphora...	39
CINNAMOMUM CASSIA.....	83
Cinnamomum saigonicum..	84
Cinnamomum zeylanicum..	84
Cinnamon....52, 83, 225,	270
Cinnamon, Ceylon.....	84
Cinnamon, oil of.....	84
Cinnamon, Saigon.....	84
Citric acid.....	211
Citrullus Colocynthis...105,	107
Citrus Limonum.....	181
Claviceps purpurea, sclerotium of.....	130
Cloves.....218,	356
Clutterbuck's elaterium....	130
Coca.....84, 102,	103
Cocaine.....	84
Cocaine hydrochloride.....	84
Cocaine hydrochlorate.....	98
Cocculus palmatus.....	37
COCCUS.....	103
Coccus cacti.....	103
Cochineal.....	103
Coffee, Mocha.....	27
Coffee-nut.....	112
Cohosh, black.....54,	55
Cohosh, blue.....	55
Cohosh, red.....	55
Cohosh, white.....	55
COLCHICI, CORMUS ET SEMEN	104
Colchicum.....	36
Colchicum autumnale.....	104
Colchicum perniciosum....	104
Colchicum root and seed....	104
Colocynth.....1,	105
Colocynth apple.....	105
Colocynth, Turkish.....	107
Colocynth vine.....	105
COLOCYNTHIS.....	105
Colombian bark.....	62
Colombo root.....	35
Commiphora Myrrha.....	219
Common broom.....	299

Digitized by Google

	Page
Compound syrup of sarsaparilla	144
Compound tar plaster	284
Confectbuch	123
Coniferæ	200
Conii folia	108
Conii fructus	108
Conium	108
Conium leaves	108
Conium maculatum	108
Conium seeds	108
Conserve of red roses	77
Convallamarin	110
Convallaria	109
Convallaria majalis	109
Convallarin	110
Convolvulus Scammonia	297
Convulsivus malignus	131
Copaiba	110
Copaiba, balsam of	111, 235
Copaifera	112
Copaifera bijuga	116
Copaifera coriacea	116
Copaifera guianensis	115, 116
Copaifera Jacquini	115
Copaifera Langsdorffii	110, 115, 116
Copaifera multijuga	116
Copaifera officinalis	110, 116
Copau, Huile de	114
Coquear	87
Cordial, blackberry	277
Cordial, blackberry, of Kentucky	52
Coriander	50
Coriander seed	117
Coriandrum	117
Coriandrum sativum	117
Cornaceæ	301
Corn silk	355
Cormus et semen colchici	104
Cornutine, Keller's	132
Cortex fructus	156
Cotton root bark	155
Cotton-wood	198
Cottonwoods	200
Couch grass	338
Cousso or Cusso	123
Cousso tree	123
Cramp bark	352
Cranberry, high	352
Cranesbill	153
Crataegus	207
Creeper, trumpet	154
Croton acutus	121
Croton jamalgota	121
Croton muricatus	121
Croton oil	117
Croton pavana	121
Croton seed	118
Croton Tiglium	117, 130
Cubeb	121
Cubeba	121
Cubeb berries	122
Cubebs	121, 356
Cubebs, candied	122
Cubebs, powdered	122
Cubebas silvestres	122
Cubera tanghin	239
Cuca	87
Cucurbita Pepo	236
Cucumis Colocynthis	107
Cucurbitifera malabariensis	222
Culver's root	180
Cumich	49
Cumin	50
Cumin, Armenian	50
Cumin, foreign	50
Cumin, mountain	50
Cumin, Roman	50
Cupayba	112
Curaçao aloes	4, 9, 11
Currants	139
Cusso or Cousso	123
Cutch	142, 143
Cypripedium	124
Cypripedium pubescens	124
Cyrene, silphium of	20
Cytisus Scoparius	299
Dakha	42
Dandelion	334
Daphne	301
Daphne Gnidium	216
Daphne Laureola	216
Daphne Mezereum	216
Dates	6
Date palm, Arabian	200
Datura	43
Datura Stramonium	323
Datura Tatula	323
Daun Gatta Gambir	143
Deadly nightshade	28
Den sleonis	334
Delphinium Staphisagria	321
Dewberry	276
Digitalis	124
Digitalis leaves	125
Digitalis purpurea	125
Digitalis seed	125
Dill	50
Dioscorides, Materia Medica of	109

Digitized by Google

	Page
Diosma, (Buchu)	32
Dispensatory, American	18
Dispensatory, Bengal	46
Dispensatory, Indian Doctor's	181
Distilled hamamelis	162
Divine plant of the Incas	85
Doctors, Indian	124
Dog fennel	213
Dogsbane	17
Drugs & Medicines of North America	185
Dryoptera Filix mas	23
Dryoptera marginalis	23
Dyes employed by American Indians	164
Ecballium Elaterium	130
Egyptian gum	1
Elaterin	130
ELATERIUM	130
Elaterium, Clutterbuck's	130
Elder	200
Electrical febrifuge	151
Ellettaria Cardamomum	48
Elm bark	338
Emetic weed	184
English euonymin craze	135
Ephemeris	96, 99, 109
Epimenidea	298
Ergot	130
ERGOTA	130
Ergot, assay of	131
Ergotism	130
ERIODICTYON	132, 134
Eriodictyon Californicum	132
Eriodictyon glutinosum	132, 133
Erythrophlœum guineense	239, 329
Erythroxyline	90
Erythroxylon Bolivianum	91
Erythroxylon Coca	84
Erythroxylon Spruceanum	91
Esere	237
Eserine	237
Esquine	291
EUCALYPTUS	134
Eucalyptus globulus	134
Eugenia aromatica	51
Euonymin	136
Euonymin craze, The English	135
EUONYMUS	135
Euonymus americanus	135
Euonymus atropurpureus	135
EUPATORIUM	137
Eupatorium perfoliatum	137
Exogonium Purga	176
Extracts of malt	192
False manna, American	195
Febrifuge, electrical	151
Fennel	50, 140
Fennel, dog	213
Fennel seed	140
Fennel wood	292
Fern, male	23
Ferric oxide, hydrated	284
Ferula	19
Ferula alliacea	21
Ferula Asafœtida	19
Ferula fœtida	19
Ferula Sumbul	332
FICUS	138
Ficus Carica	138
Fig	138
Fig tree	112
Filix mas	23
Fillœa suaveolens	240
Fingerhut	126
Flag, sweet	33
Flax seed	183
Flies, Spanish	47
Flora Brasiliensis	168
Flora Malabarica	119
Flora, niger	38
Flowers, althæa	14
Flowers, arnica	18
Flowers, orange	25
Flores benzoës	30
FŒNICULUM	140
Fœniculum vulgare	140
Food products of N. A. Indians	202
Foreign cumin	50
Foxes-glew	125
Foxglove	125
FRANGULA	140, 263
Frankincense, Java	30
Fraxinus Ornus	193
Fructus carpesiorum vel cubebarum	123
Funis uncatus	143
Furiale solatrum	28
Galangal	122, 356
Galen	31
GALLA	141
Galls	142
Galls, oak	141
Gambier	142, 143
GAMBIR	142
Gambir, Daun Gatta	143
Gambir, gatta	143
Gamboge	38

Digitized by Google

	Page
Gambogia or Cambogia...	38
Ganapride	67
Ganda	280
Garcinia Hanburii	38
Garget plant	240
Garlick	50
Gatta	144
Gatta gambir	143
Gaultheria.....144,	145
Gaultheria hispidula...145,	147
Gaultheria, oil	144
Gaultheria procumbens	146
Gaultheria procumbens, oil of	145
Gaultheria repens	145
Gayapala	118
Gelsemium	150
Gelsemium sempervirens	150
Gelsomina	150
Genista	299
Gentian	152
Gentiana	152
Gentiana lutea	152
Geranium	153
Geranium maculatum	153
German chamomile	213
Gibelmanna	192
Gigartina mamillosa	53
Ginger.....118,	355
Gingerbread	122
Gleditschia triacanthos	112
Glew, foxes'	125
Glyceria	197
Glycyrrhiza	153
Glycyrrhiza glabra glandulifera	153
Glycyrrhiza glabra typica	153
Glycyrrhiza rhizome	153
Glycyrrhiza root	153
Goa powder	54
Golden seal	164
Gombe	327
Gordon Memorial College	3
Gossypii cortex	155
Gossypii radicis cortex	155
Gossypium	155
Gossypium, fiber	155
Gourd	105
Grains of paradise.....122,	154
Grana tiglii	119
Granati cortex	156
Granatum	156
Grape, sugar of	194
Grass, bent	202
Grass, couch	338
Grass, manna	197
Grass, reed	197
Grasses, reed	203
Grindelia	158
Grindelia camporum	158
Grindelia cuneifolia	158
Grindelia robusta	158
Grindelia squarrosa	158
Griselinia	301
Ground raspberry	164
Guaiac	159
Guaiacum	159
Guaiacum officinalis	160
Guaiacum, resin of	160
Guaiacum sanctum	160
Guananepide	67
Guarana	160
Guaranis	160
Guatemala, balsam of	27
Guayacan	159
Guda	280
Guda-daru	280
Guda-sarkara	280
Guda-trina	280
Gum arabic	1
Gum Benjamin	30
Gum, Egyptian	1
Gum mastic, village producing	206
Gum of Canaan	1
Gum tragacanth	337
Gymnocladus dioica	112
Hab-el-Kathai	118
Haematoxylon	16
Hagenia	123
Hagenia abyssinica	123
Halecus verus	121
Hamamelidis cortex et folia	162
Hamamelis, distilled	162
Hamamelis leaves	162
Hamamelis virginiana	162
Hamamelis water	162
Hartshorn	264
Hashish.....41, 43,	47
Hasia	182
Hedeoma	162
Hedeoma pulegioides	162
Hellebore, American	350
Hellebore, swamp	350
Hellebore, white	350
Hematoxylon campechianum	161
Hemlock	108
Hemlock, poison	109
Hemp, Canadian	17
Hemp, Indian.....17,	40
Hemp leaf	46

Digitized by Google

	Page
Henbane	43, 166
Henna	50
Herb, mad-dog	301
Herb, soldier's	167, 212
Herbarium Amboinense	119, 143
Herb, holy	133
Herb, saint	133
High cranberry	352
Hilţit	21
Hindu physicians	118
Hing	21
Hingra	22
Hingu	19, 21
Hini	180
Historia Naturalis Brasiliæ	169
Holy herb	133
Hondura sarsaparilla	288
Honey	16, 213
Honey locust	112
Honey of canes	279
Honey-suckle	282
Hops	163
Hops, Bavarian	163
Hordeum distichon	191
Hordeum sativum	191
Horehound	205
Horehound candy	205
Horse aloes	8
Hovia	103
Huanuco	91
Huile de copau	114
HUMULUS	163
Humulus Lupulus	163
HYDRASTIS	164
Hydrastis canadensis	164
Hydrastis, white alkaloid of	166
Hydrops pectoris	128
HYOSCYAMUS, 166, 212, 324,	328
Hyoscyamus niger	166
Ikshu	280
Ikshurasa	280
Ikshurassa-kvatha	280
Incas, Divine plant of	85
Index Kewensis, 111, 116, 117, 121, 168,	326
India-senna	318
Indian Captivities, Guile's	335
Indian doctors	124
Indian Doctor's Dispensatory	181
Indian hemp	17, 40
Indian hemp, American	17
Indian poke	350
Indian rheum	269
Indian tobacco	183
Indigenous Vegetables, Account of	184
Indrasana	40
Indra's hemp	40
Ionidum Ipecacuanha	171
Ipecac	168, 243
Ipecacoanha, white	173
Ipecac, Rio	168
Ipecac root, alkaloidal value of	175
IPECACUANHA	168
Ipecacuanha ejusque facultatibus, de	169
Ipecaya	169
Irish moss	53
Island of Socotra	4
Itch-weed	350
Jaborandi	243
Jaborandi leaves, alkaloidal value of	245
Jaborandi, Maranham	243
Jalap	176, 193
JALAPA	176
Jalap, white	176
Jamalgoota	118
Jamaica quassia	259
Jamaica pepper	245
Jamaica sarsaparilla	288
Jamestown weed	323
Janjida	40
Jasmine, wild, (mad honey of)	214
Jasmine, yellow	150
Jateorrhiza	34
Jateorhiza palmata	34
Jatu	21
Jatuka	21
Java frankincense	30
Jessamine	150
Jessamine, Carolina	150
Jessamine, white	150
Jesuits' bark	68
Jesuits' powder	77
Jimson weed	323
Juice, lemon	181
Juniper	278
Juniperus Sabina	278
Kaaba	1
Kakkola	248
Kalumb	35
Kano	177
Karanfal	51
Karawya	49
Karerna	223
Karigas	139
Karos	49

Digitized by Google

	Page
Kath karanja seeds	118
Kayf	41, 44
Kewensis, Index,	111, 116, 117, 121, 168, 244, 326
Keller's Cornutine	132
Khanda	280
Khanda sarkara	280
Khartoum	2
Kilista	208
Kina	67
King's resin of podophyllum	136
KINO	177
Kombe	327
KOUSSO	123
KRAMERIA	177, 178
Krameria Ixina	179
Krameria triandra	178
Kucha-phala	223
Kuchela	223
Kuchila	223
Kulaka	223
Kunchaphala	223
Kupilu	223
Kurachilla	223
Kurkas Tiglium	121
Kuruchilla	223
Lactuca	179
LACTUCARIUM	179
Lady's slipper	124
Laffecteur, Rob de	149
LAPPA	179
Lappa major	179
Lappa minor	179
Lappa tomentosa	179
Lard	284
Laser	19
Laserpitium	21
Laurus Sassafras	294
Laurus variifolia	294
Lavanga	51
Lawsonia alba	50
Leaf, hemp	46
Leaves, belladonna	28
Leaves, blue gum	134
Leaves, buchu	32
Leaves, conium	108
Leaves, digitalis	125
Leaves, gaultheria	144
Leaves, hamamelis	162
Leech books	278
Leek of the border	109
Leguminosæ	37, 111
Leimonion lemone	182
Lemon juice	181
Lemon peel	181
Lenitive electuary	257
Leopard's bane	18
LEPTANDRA	180
Leptandra virginica	181
Lettuce opium	179
Lewis, secret cure of	313
Licorice	153
Licorice pastilles	154
Licorice root	153
Licorice, Russian	153
Licorice, Spanish	153
Ligna aloes	5
Lignaloes	4
Lignum moluccense	119
Lignum panavæ	119
Lignum quassiæ	260
Lignum tinctile campechense	161
Lignum vitæ	159
Lily of the valley	109
Limbu	181
Lime	144
LIMONIS, CORTEX ET SUCCUS	181
Limu	181
Limun	181
Link	300
Linnæan Society	131
Linseed	183
LINUM	183
Linum seed	183
Linum usitatissimum	183
Lippincott's Biographical Dictionary	76
Liquidambar orientale	331
Liquidambar orientalis	331
Liquorice root	153
Liquors, malt	192
Lloyd Library	251
LOBELIA	183
Lobelia inflata	183
Lobelia syphilitica	184
Logwood	161
Lombards	139
Loxa bark	62
LYCOPODIUM	191
Lycopodium clavatum	191
Lycopodium powder	191
Mace	122, 218, 225
Macis, description	218
Macrotys	54, 55
Macrotys actæoides	56
Macrotys Serpentaria	56
Mad-dog herb	301
Mad honey	214
Magican	142
Mahonia	31
Male fern	23

Digitized by Google

	Page
Malignus convulsivus	131
Malt	191
Malt, extracts of	192
Malt liquors	192
MALTUM	191
Mandrake	248
MANNA....192, 194, 298,	321
MANNA, AMERICAN	193
Manna ash	192
Manna, Californian	193
Manna, Father Piccolo's	203
Manna, where found	201
Manna grass	197
Manna, mountain	192
Manna of the pines	203
Maple, white	197
Maranham jaborandi	243
Maricha	248
Marigold	34
MARRUBIUM	205
Marrubium vulgare	205
Marshmallow root	14
Massa hydrargyrum	273
Mastic	205
Mastic drink	210
Mastic gum	206
Mastic of Scios	206
Mastikohoria	206
Mastich tears....26,	207
MASTICHE	205
Mastiche, confections of	211
Mastiche, collection of	207
Mastiche, commercial features	209
Mastiche, description	207
Materia Medica of Dioscorides	109
MATICO....167,	212
Matoyandika	280
MATRICARIA	213
Matricaria Chamomilla	213
Mauritius vanilla	347
Mayapple	248
Mazamora	88
Mechoacan, black	176
Mechoacan rhubarb	176
Medals, Carthaginian	157
Medals, Phenician	157
Meddygon Myddfai, 212, 299,	320
Medical Brief	277
Medical Repository	131
Medicine bark	66
MEL	213
Memorial College, Gordon	3
Menispermum canadensis	34
Menispermum palmatum	37
Mentha palustris	215
MENTHA PIPERITA	215
Mentha spicata	215
MENTHA VIRIDIS	215
Methyl salicylate	144
Mexican sarsaparilla	288
Mexican vanilla	347
MEZEREUM	216
Minores, cataputiæ	119
Mint julep	215
Mint, (peppermint)	215
Miraoh	248
Mirchai	248
Mitchella	168
Mocha coffee	27
Moeniat	259
Morbus spasmodicus	131
Morphine, white	234
MOSCHUS	217
Moschus moschiferus	217
Moss, Irish	53
Mountain balm	133
Mountain cumin	50
Mountain manna	192
Muscus clavatus	191
Muscus terrestris	191
Musk.....5,	217
Muskroot	332
Mustard, black	320
Mustard, white	319
Myddfai, Physicians of...3,	212
MYRISTICA	218
Myristica fragrans	218
Myroxylon	26
Myroxylon Toluiferum	27
Myrrh.....84, 219,	270
MYRRHA	219
Nadd	5
New Preparations, 133, 159, 182, 264,	277
N. Jahrbuch f. Pharm	110
Nights, Arabian, 5, 15, 39, 47, 106, 138, 157, 167, 214	
Nightshade, deadly	28
Nimbu	182
Nimbuka	182
Nine barks	135
Nisbu	182
North America, Drugs & Medicines of	185
North American Indian food	202
Nut, betel	143
Nut, bonduc	118

Digitized by Google

	Page
Nut, coffee	112
Nutgall	141
Nutgalls	142, 337
Nutmeg	218, 225
Nux metella	222
Nux Vomica	169, 221
Oaks	200
Oak galls	141
Oak, white	261
Oil, almond	16
Oil, aniseed	210
Oil, cinnamon	84
Oil, croton	117
Oil, gaultheria	144
Oil, gaultheria procumbens	145
Oil, origanum	336
Oil, pennyroyal	163
Oil, pimenta	245
Oil, saw palmetto	277
Oil, sweet birch	145
Oil, thyme	336
Oil, tilli	120
Oleum cassiæ	84
Oleum terebinthinæ rectificatum	336
Oleum tiglii	117
Olives	139
Opium, crop	226
Opium gum, inspecting	232
Opium implements for gathering gum	228
Opium poppy, cultivation	226
Opium poppy, gum	229
Opium poppy, mad honey from	214
Opium	42, 224, 270
Opium, lettuce	179
Opium, origin of	225
Opium poppy	225
Opium, adulterations	231
Opium, assaying	233
Opium, characteristics	231
Opium-packing for export	234
Orange flowers	25
Orange peel	25
Ordeal bean	236
Ordeal, redwater	239
Origanum	147
Origanum, oil of	336
Ouabaio	329
Ourouparia gambir	142
Paci	103
Pale rose	272
Palms	200
Palm-wine	220
Panacea of Swaim	144
Panaceas	145
Panela	88
Panoche	200
Papaver somniferum	224, 226
Paradise, grains of	122, 154
Paraguay jaborandi	243
Pareira	235
Pareira brava	235
Parilla, yellow	34
Parsley	50
Parthenium	259
Partridge berry	144, 146
Pastilles, licorice	154
Paulli, Simon	160
Paullinia Cupana	160
Paullinia sorbilis	160
Pavame	290
Pavana lignum	119
Peachwood	161
Peel, lemon	181
Peel, orange	25
Pellitory root	259
Pernambuco jaborandi	243
Pen-king	267
Pennyroyal	162
Pennyroyal, American	162
Pennyroyal, oil of	163
Pepo	236
Pepper	246, 356
Pepper, black	123, 246
Pepper, cayenne	48
Peppermint	147, 215
Pepper-plant	247
Pepper, white	123
Perfumes, Book of	274
Pernambuco jaborandi	243
Persian caraway	50
Peru, balsam of	26, 114
Peru balsam tree	112
Peruvian bark	19, 62, 258
Phanita	280
Pharmacist, The	133
Pharmacologia	119
Pharmacopeia Amstelodamensis	113
Pharmacopeia, Mass. Med. Society	146
Pharmacopeia of India, Waring's	46
Pharmacopeias (See Bibliographical Index)	
Pharmacographia (See Bibliographical Index)	
Phaseoleæ	237
Phragmites communis	197, 202
Physic root	180

Digitized by Google

	Page
Physicians, Arabian	1
Physicians, Hindu	118
Physicians of Myddvai	3
Physicians, Welsh	264
PHYSOSTIGMA	236
Physostigma cylindrosperma	237
Physostigma mesoponticum	237
Physostigma venenosum	236
PHYTOLACCA	240, 249
Phytolacca berries	240
Phytolacca decandra	240
Phytolacca, properties and uses	241
Phytolacca root	240
Picrasma excelsa	259
Picræna excelsa	261
Pigaya	169
Pilea pumila	55
Pills of poppy juice	224
PILOCARPUS	243
Pilocarpus giganteus	244
Pilocarpus goudutianus	244
Pilocarpus grandiflorus	244
Pilocarpus guaianensis	244
Pilocarpus heterophyllus	244
Pilocarpus humboldtii	244
Pilocarpus Jaborandi	243, 244
Pilocarpus latifolius	244
Pilocarpus leaves of commerce	244
Pilocarpus longiracemosus	244
Pilocarpus macrocarpus	244
Pilocarpus microphyllus,	243, 244
Pilocarpus pauciflorus	244
Pilocarpus pennatifolius,	243, 244
Pilocarpus racemosus	244
Pilocarpus riedelianus	244
Pilocarpus selloanus	244
Pilocarpus spicatus	244
Pilocarpus subcoriaceus	244
Pilocarpus trachylophus	244
PIMENTA	245
Pimenta berries	245
Pimenta officinalis	245
Pimenta, oil of	245
Pimento	245
Pimpinella Anisum	16
Pinang	143, 144
Pine sugar	196
Pini nuclei moluccani	119
Pinite	196
Pinkroot	321
Pinus australis	336
Pinus Lambertiana	196
Pinus palustris	336
Pinus ponderosa	196
Pinus strobus	196
Pipe gamboge	38
PIPER	246
Piper angustifolium	212
Piper Betle	144
Piper Cubeba	121
Piper Jamaicense	245
Piper jamaicense sive pimenta	245
Piper nigrum	246
Pippali	247
Pipsissewa	52
Pistacia Lentiscus	205
Pitachandana	286
Plantain	282
Plautus, Rudens of	20
Poayeros	174
Poems, Seven Hanged	1
Podophyllin	250
PODOPHYLLUM	248, 249, 284
Podophyllum peltatum	248, 250
Podophyllum, resin of	250
Poisons, (arrow), notes on	328
Poison hemlock	109
Poison ivy	271
Poison oak	271
Poison-vine, white	150
Poke, Indian	350
Poke root	240
Polygala paucifolia	145
Poma cathartica	119
Pomegranate	156, 248
Pomegranate bark	156
Pomegranate rind	156
Pomegranate seed	158
Pontic rheum	269
Poppy heads, wine of	224
Poppy juice, pills	224
Potassium carbonate	210
Powdered cubebs	122
Powder, goa	54
Powder, Jesuits'	77
Powder, lycopodium	191
Precious spice	83
Preservative, tooth	178
Prickly ash	354
Proverbs	83
Prune	257
PRUNUM	257
Prunus Amygdalus	15
Prunus domestica	257
Prunus serotina	257
PRUNUS VIRGINIANA	257

Digitized by Google

	Page
Psalms (cinnamon)	83
Psychotria emetica	172
Psychotria Ipecacuanha	168
Pterocarpus indicus	177
Pterocarpus Marsupium	177
Pterocarpus santalinus	285
Pulvis parturiens	131
Pumpkin seed	236
Pungent berry	248
Punica Granatum	156
Puntsao	234
Purgative tuber	176
Purging apple	119
Purging cassia	52
Pursh's Flora Americanæ Septentrionalis	138
PYRETHRUM	259
Pyrola umbellata	146
Quananegine	67
Quasci	261
QUASSIA	259
Quassia amara	259
Quassia, Jamaica	259
Quassia, Surinam	259
Quassiæ lignum	260
Quebracho	24
Quebracho blanco	25
Quebracho Colorado	24, 25
Quebracho gum	24
Quebracho moreno	25
Quebracho negro	25
Quebracho prieto	25
Quebracho resin	24
Queen's root	322
QUERCUS	261
Quercus alba	261
Quercus infectoria	141
Quillaia	263
QUILLAJA	262
Quillaja Saponaria	262
Quilloan, (wash)	262
Quitel	180
Quin-quinia	67
Quina-quina	67
Quinaquinia	67
Quinia	67
Quinia-quinia	66
Quinine	62
Quinquinia	67
Radix pontica	268
Radix rha barbari	270
Raisins	122, 139
Rakee, mastic	210
Raki, mastic	210
Raspberry	276
Raspberry, ground	164
Rattle root	55
Rattlesnake root	55
Rattle weed	55
Rawand-el-dawabb	271
Red cinchona	62
Red cohosh	55
Red rose	272
Red sandalwood	285
Red saunders	285
Redwater ordeal	239, 329
Reed grass	197
Reed grasses	203
Reeds	195
Remijia	62
Reobarbe	270
Resin of guaiacum	160
Resin of podophyllum, discovery	250
Resin of podophyllum, King's	136
RESINA PODOPHYLLI	250
Resina podophylli (Commercial Introduction)	251
Resina podophylli (name)	251
Reu barbarum	269
Revelation	83
Rewand	270
Rewash	270
Rewash-i-dewana	270
Rhacoma	268
Rhamnus californica	264
Rhamnus catharticus	263
Rhamnus Frangula	140
RHAMNUS PURSHIANA,	134, 140, 141, 263
Rha ponticum	268
Rhatany	178
RHEUM	267, 268
Rheum barbarum	269
Rheum, Indian	269
Rheum officinale	267
Rheum palmatum	267
Rheum, pontic	269
Rheum Ribes	270
Rheum tanguticum	267
Rheum tataricum	270
Rhubarb	267, 269
Rhubarbe	271
Rhubarb, Chinese	270
Rhubarb, fool's	270
Rhubarb, Khorasan	270
RHUS GLABRA	271
Rhus glabrum	271
Rhus Lentiana	201
Rhus Toxicodendron	159, 271
Rhus veatchiana	200

Digitized by Google

	Page
Ribarbari	269
Ribas	270
Rice, yellow	158, 215
Richweed	55
Ricinus communis	121
Rind, pomegranate	156
Rio ipecac	168
Rio Janeiro jaborandi	243
Riwas	270
Roa	158
Roa side	158
Rob anti-syphilitica, sirup of	144
Rob de Laffecteur	149
Roman chomomile	17, 213
Roman cumin	50
Root, arnica	18
Root bark of sassafras	289
Root, belladonna	28
Root, black	180
Root, Bowman	180
Root, Brinton	180
Root, calumba	34
Root, colchicum	104
Root, colombo	35
Root, Culver's	180
Root, glycyrrhiza	153
Root, licorice	153
Root, marsh mallow	14
Root, musk	332
Root, pellitory	259
Root, physic	180
Root, phytolacca	240
Root, pink	321
Root, poke	240
Root, queen's	322
Root, rattle	55
Root, rattlesnake	55
Root, sarsaparilla	288
Root, yellow	164
Rosa centifolia	272
ROSA GALLICA	272
Roseaux	194
Rose, honey of	214
Rosemary	282
Rose, pale	272
Rose, red	272
Rose water	273
Rose, white	273
Roses, attar of	272
Roses, garden of	275
Roses, red, conserve of	77
Round cardamon	245
Rubiaceæ	168
Rubus Idæus	276
Rubus trivialis	276
RUBUS VILLOSUS	276
Rudens of Plautus	20
Ruibardo	269
Russian licorice	153
Rusot	32
Rutaceæ	243
Rye, spurred	130
SABAL	277
Sabal serrulata	277
Sabdakalpadruma	182
SABINA	278
Sabine	278
Saccharine	198
Saccharon	279
SACCHARUM	278, 280
Saccharum officinarum	278
Sacred bark	266
Saffron	122, 215, 270
Sage	280, 281
Saigon cinnamon	84
Saint herb	133
Saladinus of Ascoli	28
Salicylate, methyl	144
Salvadora persica	320
Salve bark	338
SALVIA	280
Salvia officinalis	280
Sandal, white	286
Sandal, yellow	286
Sandalwood paste	286
Sandalwood, red	285
SANGUINARIA	164, 249, 282
Sanguinaria canadensis	282
Sanguinarine nitrate	283
Sanguis Draconis	6
SANTALUM RUBRUM	285
SANTONICA	287
Santonin	287
Santoninum	
Sanskrit,	4, 19, 29, 51, 117, 181, 247, 287, 333
Sanskrit (sugar)	280
SARSAPARILLA	288
Sarsaparilla, Honduras	288
Sarsaparilla, Jamaica	288
Sarsaparilla, Mexican	288
Sarsaparilla, root	288
Sarsaparilla, syrup of	145
Sarsaparilla compound syrup	144, 217
SASSAFRAS	289
Sassafras officinale	294
Sassafras, root bark of	289
Sassafras Sassafras	294
Sassafras variifolium	289, 295

Digitized by Google

	Page
Sassafrine	296
Sassy bark	240
Savin	278
Saw palmetto	277
Saw palmetto berry	277
Saw palmetto oil	277
Scammonium	297
Scammony	270
Scammony plant	27
Schools of Salerno	1
Scilla	298
Scios, mastic of	206
Sclerotium of Claviceps purpurea	130
Scoparius	299
Scopola	299, 301
Scopola carniolica	299, 300
Scopola, sophisticant of belladonna	301
Scopola trichotoma	300
Scopolamine hydrobromide	299
Scopolia atropoides	300
Scopolia carniolica	300
Scopolina atropoides	300
Scutellaria	301
Scutellaria in hydrophobia,	303, 315
Scutellaria lateriflora	301
Secale	130
Secale cereale	130
Secale cornutum	130
Secret cure, Lewis's	313
Seeds, caraway	49
Seeds, cardamom	49
Seeds, Cathay	118
Seeds, colchicum	104
Seeds, conium	108
Seeds, coriander	117
Seeds, croton	118
Seeds, digitalis	125
Seeds, fennel	140
Seeds, kathkaranja	118
Seeds, linum	183
Seeds, pumpkin	236
Seeds, sesame	16
Seeds, stramonium	325
Semen colchici	104
Semper vivum, (aloe)	6
Senapium	320
Senega or Seneca	317
Senna	193, 318, 321
Senna, India	318
Senna, Tinnevelly	318
Serenoa serrulata	277
Serpentaria	319
Sesame seed	16
Seven barks	135
Seven Hanged Poems	1
Seychelles vanilla	347
Shore, leek of the	109
Sidhu	280
Silphium	20
Silphium of Cyrene	20
Sinapis alba	319
Sinapis nigra	320
Sirup of Rob anti-syphilitica	144
Skordolasaron	20
Skullcap	301
Skunk cabbage	351
Slippery elm	338
Small jaborandi	243
Smilax medica	288
Smilax officinalis	288
Smilax ornata	288
Snakeroot, black	54
Snakeroot, Texas	319
Snakeroot, Virginia	319
Soap bark	262
Society, Linnæan	131
Socotra, island of	4
Socotrine aloes	4, 5
Soda-water	263
Solanum	29
Solanum Dulcamara	30
Solanum manicum	300
Solanum nigra	30
Solanum somniferum	29
Solanum somniferum alterum	300
Solanum somniferum baccifernm	300
Solatrum furiale	28
Soldier's herb	167
Soldier's tree	167, 212
Solomon's temple	157
Sorghum	280
South American vanilla	347
Spanish chamomile	259
Spanish flies	47
Spanish licorice	153
Spearmint	215
Spere mynte	216
Spice, precious	83
Spigelia	168, 321
Spigelia marilandica	321
Spiræa lobata	145, 147
Spiræa Ulmaria	145, 147
Spurred rye	130
Squawroot	55
Squill	298
Srikhanda	286

Digitized by Google

	Page
Stacte, myrrh	220
Staphisagria	321
Stavesacre	321
Stigmata maydis	355
Stillingia	322
Stillingia sylvatica	322
Stink-finger	22
Storax	331
Strabo	20
Stramonium	29, 323
Stramonium (Atropine from)	324
Stramonium seed	325
Strasburg turpentine	335
Strophanthus	326
Strophanthus hispidus	326, 327
Strophanthus Kombe,	326, 327, 328
Strophanthus, pharmacopeial record of	330
Strychnos	329
Strychnos Nux vomica	221
Styrax	331
Styrax Benzoin	30
Styrax officinale	331
Sucrose	278
Sugar	198, 203, 278
Sugar cane	199
Sugar of the grape	194
Sugar, pine	196
Sumach	271
Sumbul	332
Surinam quassia	259
Susruta	19, 48, 53
Swaim's Panacea	144, 149
Swamp hellebore	350
Sweet almond	15
Sweet birch	145
Sweet birch oil	145
Sweet and bitter orange	25
Sweet flag	33
Sweet wood	154
Swertia Chirayita	53
Sycamore	200
Synopsis Plantarum Diaphoricarum	111
Syrup, buckthorn	264
Syrup, compound, of sarsaparilla	144, 217
Syrup, poppy	224
Syrup, sarsaparilla	145
Tahiti vanilla	347
Tamarind	332
Tamarindus	332
Tamarindus indica	332
Tanghin poison-nut	239
Tanghinin venenata	239
Taraxacum	334
Taraxacum officinale	334
Tar plaster, compound	248, 284
Temple, Solomon's	157
Terebinthina	335
Terra Japonica	143
Texas snakeroot	319
The Pharmacist	133
Thoroughwort	137
Thyme, camphor of	336
Thymelaceæ	301
Thyme, oil of	336
Thymol	336
Thymus vulgaris	336
Tiglii, oleum	117
Tiglium officinalis	121
Tilli, oil of	120
Tincture, capsicum and myrrh	48
Tinnevelly senna	318
Tintidi	334
Tlilxochitl	342
Tobacco antidote	152
Tobacco, Indian	183
Toddalia	301
Tolu	27
Tolu, balsam of	27, 114
Toluifera balsamum	27
Toluifera Pereiræ	26
Tolutanum balsamum	27
Tooth preservative	178
Tragacantha	337
Tragacanth, gum of	337
Tree, baobab	329
Tree, cousso	123
Tree, fig	112
Tree, soldier's	167, 212
Triticum	338
Trocar, vegetable	18
Trochisci	143
Trumpet creeper	154
Truxillo leaves (coca)	91
Tuber, purgative	176
Turkish colocynth	107
Turpentine	335
Turpentine, Strasburg	335
Ulmus	338
Ulmus fulva	338
Uncaria Gambier	143
U. S. Agricultural Report	202
Uragoga Ipecacuanha	168
Urginea maritima	298
Uva Ursa	339
Vacha	33
Vaina	341

Digitized by Google